Design Plan - Volume 1 of 2

Pre-Design Sampling Results

CanonieEnvironmental

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

DESIGN PLAN
VOLUME 1 OF 2
PRE-DESIGN SAMPLING RESULTS
PAS CLOTHIER SITE
GRANBY, NEW YORK

1.0 INTRODUCTION

This document provides the Pollution Abatement Services (PAS) Clothier Potentially Responsible Parties' (PRPs) Design Plan for the PAS Clothier disposal site in Granby, New York, prepared by Canonie Environmental Services Corp. (Canonie). The Design Plan has been developed following the guidelines set forth in the Environmental Protection Agency's (EPA) OSWER Directive 9355.0-4A entitled "Superfund Remedial Design and Remedial Action Guidance" (EPA, 1986).

The Design Plan is separated into two volumes. Volume 1, Pre-design Sampling Results presents the results of the pre-design sampling and the design criteria that were used to develop the construction drawings and specifications for the remedial action. Volume 2 - Construction Plan, Specifications, and Schedule presents the construction plan, specifications, drawings, and implementation schedule for the remedial action.

1.1 Site Background

The PAS Clothier Superfund site is a privately owned, approximately 15-acre (Ebasco, 1988) land parcel located in a rural area approximately seven miles south of Fulton, New York. The general site location is shown on Figure 1. The site was placed on the National Priorities List in 1984. Within this parcel is an approximately 6-acre (Ebasco, 1988) area constituting the portion of the site where the EPA alleges at least 2,200 drums of chemical wastes were stored/dumped from the PAS Clothier operation at Oswego, New York. Based on Remedial Investigations/Feasibility Studies (RI/FS) completed in August 1988, it was determined that the primary sources of contamination at the site were hazardous substances contained in 2,200 drums and the hazardous substances that had leaked out of damaged drums (Ebasco, 1988). In the summer of 1986, 1,858 drums were removed from the site for disposal by the PRPs under an Administrative Order (Ebasco, 1988). The remaining 271 drums were removed for disposal in July 1987 and 1988 by EPA contractors (Ebasco, 1988). Visibly contaminated soil was also removed from the site in July 1987 (Ebasco, 1988).

The August 1988 RI/FS report indicates that the only source material remaining on-site is residual low-level contaminated soil containing xylene, phenol, carcinogenic polynuclear aromatic hydrocarbons (CPAHs), and polychlorinated biphenyls (PCBs) (Ebasco, 1988). The RI/FS concludes that the only pathway of exposure is from contact with surface soils containing PCBs and CPAHs (Ebasco, 1988).

The site's shallow ground water has been affected by low levels of volatile organic compounds (VOCs), primarily trichloroethene and tetrachloroethene. Under the current use scenario for the site, the EPA concluded in the Record of Decision (ROD) that no ground water exposure pathways are believed to exist (EPA, 1989). The shallow ground water is contained in a low-yielding aquifer and is unlikely to be used as a water supply. Long-term ground water monitoring and site-use restrictions have been prescribed to address affected ground water.

1.2 Site Description

The PAS Clothier site is located in a rural area of western New York. The site is heavily vegetated with grasses and with trees and shrubs in the wetland area. The wetland area is created by Ox Creek, which flows north through the site. The upland area lies about 10 to 20 feet above the wetland. A gravel access road runs south from South Granby Road to the southern property line. Along the road, several concrete decontamination pads remain from prior remedial activities.

1.3 Physical Characteristics of the Site

Data and interpretations regarding the physical characteristics of the site were primarily drawn from the RI/FS prepared by URS Company (URS, 1987) and the Final Supplemental RI prepared by Ebasco Services, Inc. (Ebasco, 1988). The sections on demography and land use, climatology, geology, hydrogeology, and surface water hydrology are essentially identical to those in the URS RI/FS and the Ebasco RI.

1.3.1 Demography and Land Use

The PAS Clothier Disposal site is located in a rural area near the town of Granby, Oswego County, New York. Residences are sparsely located approximately 1/2 mile to the east and west of the site, along South Granby Road and Ley Creek Road. The closest population center is the city of Fulton (1980 U.S. Census population 13,312). The population of Oswego County was 113,901 in the 1980 census, representing approximately a 13% increase over the 1970 population of 100,897 (Ebasco, 1988).

Land use in the vicinity of the site is predominantly agricultural. Soil is considered to be the primary natural resource of the area. Sand pits are also located in the vicinity with the closest being approximately 1,300 feet to the east. A NYSDEC-designated wetland passes through the site to the immediate west of the area used for waste disposal as shown on Figure 2. The wetlands provide a haven for aquatic life, migratory waterfowl, and birds. Ox Creek flows through the middle of the wetlands in a northerly direction and feeds into the Oswego River approximately one mile to the northeast (Ebasco, 1988).

1.3.2 Climatology

Climatic data for the city of Syracuse, New York was obtained from the National Climatic Data Center [National Oceanic and Atmospheric Administration (NOAA), 1985]. Although the city of Oswego is closer to the site than Syracuse, climatic data for Syracuse was considered more representative of site conditions because of Oswego's proximity to Lake Ontario (Ebasco, 1988).

Mean annual precipitation for the 30-year period from 1956 to 1985 was 36.79 inches. Annual precipitation ranged from a minimum of 27.10 inches in 1964 to 58.17 inches in 1976. The mean monthly precipitation remains under 3.1 inches for most the year, increasing to above 3.3 inches in June, July, and August. A maximum monthly rainfall of 12.3 inches was recorded in June 1987. A 24-hour maximum of 4.27 inches was recorded in August 1954. Snowfall occurs from October through April, and occasionally in May.

A maximum monthly snow accumulation of 72.6 inches was recorded in February 1958. A 24-hour maximum of 24.5 inches was recorded in January 1966 (Ebasco, 1988).

The mean annual temperature for the 30-year period from 1956 to 1985 is 47.6°F. The highest recorded temperature was 98°F in June 1953. The lowest recorded temperature was -26°F in both February 1979 and January 1966 (Ebasco, 1988).

Prevailing winds are westerly, as reported in the NOAA Wind-Ceiling-Visibility Data for the Syracuse Airport (NOAA, 1981). Wind speeds averaged 8.4 knots (9.7 mph) over the ten-year period from 1976 to 1984. The maximum average wind speed is 10.3 knots (11.8 mph) for February. The minimum average wind speed is 6.9 knots (7.9 mph) for both June and August (Ebasco, 1988).

1.3.3 Geology

The section on Geology includes a discussion of regional geomorphology, bedrock geology, and soils. Regional data were obtained from referenced publications. Interpretations regarding site-specific geology were based on the 12 URS soil borings completed during 1985-1986 (Ebasco, 1988).

1.3.3.1 Regional Geomorphology

The site is situated in the Lake Ontario section of the Interior Lowlands physiographic province. This province is a region of gently rolling hills and intervening flatlands, with elevations that range from 246 feet mean sea level (MSL) at Lake Ontario to approximately 400-600 feet MSL on hilltops. The region is underlain by gently dipping sedimentary rocks (sandstones, siltstones, shales, limestones, dolostones, and evaporites) of Lower Paleozoic Age. Bedrock does not crop out because of an overlying mantle of unconsolidated material, composed principally of glacial deposits. In most upland locations, glacial deposits include a nearly ubiquitous mantle of glacial till that is formed locally into elongated ridges (or drumlins), a variety of glacial meltwater sand and gravel deposits, and

fine-grain glacial lake (glacio-lacustrine) sediments. Typically, drumlins form the hilltops of the region. In the lower elevations, glacial till is either absent, due to meltwater erosion, or covered with glacial meltwater deposits, glacial lake deposits, or alluvium and swamp deposits (peat and muck). The glacial deposits have been reworked into alluvium in the valleys of many of the larger rivers (Ebasco, 1988).

1.3.3.2 Bedrock

The New York State geologic map (Fisher et al., 1970) indicates that bedrock beneath the Clothier Disposal site consists of rocks with the Clinton Group of Silurian Age. This group is composed of alternating layers of red and green sandstone and shale, with occasional thin beds of limestone (Kantrowitz, 1970). These rock units occur in an outcrop belt with a strike from east to west across central New York state. Dip is generally to the south. The outcrop belt thins to the east along the Allegheny Escarpment; to the west, it is largely obscured by glacial deposits along the northern shore of Lake Ontario. Regionally, the Clinton dips gently beneath the younger Silurian formations to the south. The overlying Silurian Lockport Group occurs about 2.5 miles to the south. The underlying Silurian Medina Group and Late Ordovician Queenston Formation occur about 5.5 miles north of the site (Ebasco, 1988).

Two near-orthogonal principal joint sets have been reported (Isachsen and McKendree, 1977). One set ranges in strike from approximately N70°E to N80°E. The second set ranges from approximately N25°W to N50°W. Both sets of joints are near vertical. URS examined a statewide compilation of lineaments and faults identified by analysis of Landsat 1 (ERTS) imagery but did not identify any major bedrock structural features in the site area (Ebasco, 1988).

Bedrock was not sampled at the site during the subsurface investigation. Seismic refraction investigations indicate that bedrock is generally from 35 to 55 feet below the ground surface. Boring CB-1 was reportedly advanced to refusal at a depth of 40.2 feet. This refusal may represent the

top of bedrock surface which would be consistent with the seismic refraction results (Ebasco, 1988).

1.3.3.3 Soils

Unconsolidated materials at the site have been grouped into five generalized stratigraphic units. From the top of bedrock to the ground surface, these units include: Glacial till, sand and gravel, fine sand and silt, clayey silt, and artificial fill. A unit of peat, marl, muck and clay (bog deposits) was mapped by Muller and Miller (1980) in the swamp of Ox Creek. This unit was not sampled during drilling because borings (both URS and Ebasco) were located east of the swamp (Ebasco, 1988).

The five generalized stratigraphic units are detailed as follows:

Glacial Till Unit

Glacial till typically is found overlying bedrock. Glacial till was encountered as the lowermost sampled unit in the URS borings CBW-2D and CBW-4D at a depth of 35.7 and 27.0 feet, respectively. Glacial till at the site is compact to very compact, gray to purplish-gray in color, and is well graded from coarse to fine (poorly sorted) in texture. A sample of till from boring CBW-4D was sieved for grain-size distribution, and was found to contain predominantly sand, some gravel and little silt. The Unified Soil Classification Group for this sample is GM (Ebasco, 1988).

Sand and Gravel Unit

Sand and gravel was encountered in boring CBW-1 from a depth of 11.5 feet to the bottom of the boring at 54.0 feet. This area is most likely the subsurface extension of a kame or ice-contact deposit which forms the low hill east of the site area (Muller and Miller, 1980). In boring CBW2-1B, this deposit is coarsely stratified and consists of alternating strata with varying percentages of sand and gravel. This unit was also found in thinner strata in borings CB-1, CBW-2 and CBW-7. Its occurrence in these borings, which are marginal to the kame deposit, may represent erosion of

the kames onto the bottom of the proglacial or postglacial lake which subsequently deposited the fine sand and silt unit. The sand and gravel unit is generally medium compact to compact in density and brown in color. Four samples of this unit were sieved for grain-size distributions. Two of these samples were composed entirely of sand and gravel, and two contained some fine sand and silt. The Unified soil Classification Group for the two sand and gravel samples is SP (Ebasco, 1988).

Fine Sand and Silt Unit

A relatively thick section of lacustrine fine sand and silt was encountered in most of the borings on-site. This unit is part of a widespread occurrence of glacio-lacustrine deposits which extend across most of the plains in the area (Muller and Miller, 1980). The unit is thinnest at CBW-1B (4.5 feet), where it overlies the thick sand and gravel unit. The bottom of the fine sand and silt unit was encountered in five borings, with the greatest thicknesses found at CBW-2D (30.1 feet) and CB-1 (31.0 feet). Three borings were terminated in this unit (Ebasco, 1988).

The fine sand and silt unit is generally loose to medium dense and brown in color. The unit is finely stratified, commonly with alternating parings or seams of fine sand and silt. Nine sieve analyses were performed by URS on samples of this unit. Samples ranged from predominantly fine sand with a trace of silt to slightly more than 50 percent silt. The Unified Soil Classification Group for these samples is SM (Ebasco, 1988).

Clayey Silt Unit

A surficial mantle of clayey silt was encountered in all borings, ranging in thickness from 4.9 to 7.0 feet. This unit appears to be unstratified and may be lacustrine or eolian in origin (Ebasco, 1988).

This unit generally ranges in consistency from soft to stiff. It is brown in color and typically contains roots near the ground surface. URS conducted three Atterberg Limit tests and one sieve analysis on four samples of this unit. The sieved sample from CB-1 contained 15 percent fine sand

and 85 percent silt and clay. The other three samples are classified as clayey silt (from CB-1 and CBW-4D) or silt and clay (from CBW-1B), on the basis of their plasticity indices (Ebasco, 1988).

Artificial Fill

Various types of fill materials were observed at the surface in part of the site prior to drum removal. These included piles of drums containing chemical waste, demolition debris, household waste, and junked vehicles. At the time of the 1985 drilling (URS RI field work), drums were being sampled and staged in preparation for their removal. The largest drum piles were located near monitoring wells CBW-7 and CBW-8. The drums were generally in poor condition and leaking (Ebasco, 1988).

In the northern half of the site, household rubbish was encountered in test pits CTP-2 and CTP-3. These test pit locations were selected on the basis of magnetometer data which indicated the possible presence of buried metal at these locations. Metallic debris, including paint cans and beer cans, was encountered in these test pits; however, no buried drums were found (Ebasco, 1988).

A narrow, north-south trending ridge, 4 to 8 feet high, occurs in the southern part of the site just east of the swamp. The ridge did not display any magnetic anomaly, but was investigated because its morphology suggested that is was not a natural landform. Test pit CTP-1 was excavated into this ridge and encountered a loose silty soil. According to URS, this soil was excavated from an unknown location, possibly from the ground surface at the sand pits east of the site. It is also possible that the soil was derived from another location on-site, representing material displaced by burial of refuse or other materials (Ebasco, 1988).

1.3.4 Hydrogeology

The discussion on hydrogeology, similar to that on geology, is based on referenced publications and site-specific data, the latter derived from the 10 monitoring wells completed at the site. Interpretations regarding site

hydrogeology have been modified slightly from those in the URS report in response to a re-evaluation of the existing data (Ebasco, 1988).

1.3.4.1 Regional Hydrogeology

The bedrock unit underlying the site (Silurian Clinton Group) produces average well yields of three gallons per minute (gpm) in the Oswego County area (Kantrowitz, 1970). Bedrock aquifers in the region generally transmit water through secondary porosity features, such as joints and fractures. To a minor extent, the sandstones also transmit water by primary intergranular porosity. Wells tapping bedrock aquifers in Oswego County have average depths of 85 to 90 feet. Salty ground water has been reported within the upper 100 feet of bedrock (Kantrowitz, 1970).

Muller and Miller (1980) provide designations of the potential for well yields from unconsolidated materials in the site area. They indicate that sand and gravel kame units have a good potential for well yields (more than 50 gpm) and that the potential for well yields in fine sand and silt units range from moderate (5 to 50 gpm) to poor (less than 1 gpm). The till in Oswego County, which has a sandy composition, yields only one to two gpm from large diameter dug wells, and glacio-laucustrine deposits can be expected to yield the same or less (Kantrowitz, 1970).

1.3.4.2 Site Hydrogeology

Water levels were measured by URS at the site on April 2, 1986, and November 6, 1986. Maximum fluctuation between these measurements was 1.35 feet at well CBW-1S. The November measurements were used in conjunction with the land surface configuration to produce a water-level elevation map. The shallow wells from the paired wells were used in producing the map because they have screened intervals that straddle the water table. The map shows a general decrease in water-table elevation from east to west, with a depression coinciding with the gentle swale separating the two hills in the approximate middle of the site. The steepest water-level gradient occurs near the break in slope at the swamp to the west. The map indicates a general direction of ground water flow from east to west (Ebasco, 1988).

The paired wells at locations CBW-1, CBW-2 and CBW-4 allow a determination of the vertical component of groundwater flow. Vertical hydraulic-head gradients were calculated based on the two sets of water-level measurements. Downward gradients existed during both measurement periods at all three well pairs, indicating potential groundwater recharge at the site. Downward gradients were consistently higher in November that April, probably due in part to slightly higher water levels in the shallow wells because of the curtailed evapotranspiration which typically occurs in autumn. The variations in vertical gradients roughly correspond to stratigraphic units. Well pair CBW-1 screened in sand and gravel had low vertical gradients. The highest vertical gradients are in well pair CBW-4, screened in fine sand and silt. Well pair CBW-2, which is screened in both units, has a vertical gradient in between those of the other two well pairs for the April measurements, and a gradient similar to the gradient of well CBW-1 for the November measurements (Ebasco, 1988).

Horizontal hydraulic conductivity values were determined from slug tests and correspond to stratigraphic units. Values measured in two wells screened in the sand and gravel unit were significantly higher than the other units at the site. The average value for the sand and gravel unit is about 46 feet per day (1.6 x 10 (-2) cm/sec). Five tests conducted in wells screened in the fine sand and silt unit showed relatively smaller values. The average value for this unit was about one foot per day (3.5 x 10 (-4) cm/sec). Three tests conducted in wells screened in both the fine sand and silt unit and the sand and gravel unit showed intermediate values (Ebasco, 1988).

Although not tested in the laboratory or in the field, it is estimated from comparison to literature values (Freeze and Cherry, 1979) that the surficial clayey silt has a hydraulic conductivity of approximately 1 x 10 (-6) cm/sec.

Laboratory analyses of soil moisture content were performed on all 18 soil samples collected during well installation. The values of moisture content for units below the water table reflect the total porosity. The fine sand and silt unit showed the largest porosity. The moisture content of the

fine sand and silt unit above the water table was lower than below the water table because of the existence of partially saturated void spaces. For the two units above the water table, the clayey silt showed a larger moisture content that the fine sand and silt because of the inverse relationship between soil texture and moisture content in the unsaturated zone (Ebasco, 1988).

1.3.5 Surface Water Hydrology

The area used for waste disposal on the Clothier property is situated on a gently sloping parcel of land draining towards Ox Creek and its associated wetlands. The east-west trending swale across the central portion of the site channels runoff toward the creek. Run-off from the site is either westward, down the slope that separates the disposal area from the wetlands, or northward/southward into the swale and then westward (Ebasco, 1988).

Ox Creek originates approximately 6.7 miles upstream of the site. Mud Creek, a major tributary, joins Ox Creek approximately 800 feet southwest of the Clothier property. Ox Creek and its associated wetlands continue northward of the Clothier Disposal site until Ox Creek discharges into the Oswego River approximately 2.5 miles downstream. Eighteen miles downstream of the site the Oswego River flows into Lake Ontario. The average rate of flow past the site is about 35 cubic feet per second. The creek drains an area of approximately 26 square miles (Ebasco, 1988).

A Flood Insurance Study to investigate the existence and severity of flood hazards in the town of Granby was initiated in 1978 and published in 1982 (FEMA, 1982). The Oswego River and the lower portion of Ox Creek (downstream of the site) were studied using methods established by the Federal Emergency Management Agency (FEMA). Ox Creek was studied by URS using approximate FEMA methods in the vicinity of the site. A portion of the site was found to lie within the 100-year floodplain, coinciding approximately with the wetlands and other areas below the 360-foot contour (Ebasco, 1988).

1.4 Requirements of the ROD

The remedial action selected in the PAS Clothier ROD addresses the principal threat at the site, namely low-level residual soil contamination. The ROD also prescribes a long-term ground water monitoring program to assure that no significant increase in the observed low levels of ground water contamination will develop.

The EPA has determined that the risk levels associated with the residual soil contamination are minimal and within the range considered acceptable for Superfund remedies. The selected remedy, covering contaminated areas with one foot of clean soil, provides additional protection by reducing the potential for direct contact and ingestion of low-level contaminated soil.

The major components of the remedial action identified in the ROD are (EPA, 1989):

1. Placement of a one-foot clean soil cover, brought from an off-site source, over the contaminated area. Sampling will be performed during the design phase to determine the extent of the areas of residual contamination requiring covering;

2. Regrading and revegetating the site to prevent soil erosion and to minimize surface water runoff towards neighboring properties, Ox Creek, and the adjacent wetland. The regrading plan and types of vegetation will be determined during the design phase and will be compatible with the wildlife habitat;

3. Installing riprap, as needed, on the embankment sloping towards Ox Creek to prevent soil erosion. The extent of the riprap will be determined during the design phase and will consider the impact on the wildlife habitat;

4. Performing long-term ground water, soil, and Ox Creek sediment and surface water monitoring to evaluate any changes should they

occur. The long-term monitoring program will consider the installation of additional wells, including bedrock wells. Based upon the results of the monitoring program, sampling of the private residential wells in areas neighboring the site and the deeper aquifer would be performed, if warranted;

5. Performing construction and post-construction air monitoring. This may also include, but is not limited to, pre-construction air monitoring and/or analyses to further delineate areas of the site requiring covering; and

6. Applying, to the extent possible, institutional controls to prevent the utilization of the underlying ground water (e.g., through the drilling of wells in the shallow aquifer), the future development of the site for residential use, or any use involving excavation the site or significant disturbance of the soil cover. Any institutional controls, including, without limitation, deed restrictions or easements, shall be consistent with New York state law.

In order to meet the requirements of the ROD, the following activities/design considerations were addressed in developing the remedial design.

1. Identification of the areal extent of surface soil contamination exceeding the ROD-specified remediation levels in the area of the five locations identified in the ROD;

2. Clearing and grubbing the area requiring cover;

3. Regrading the site for erosion protection;

4. Placing a one-foot-thick layer of clean soil over the area with surface contamination;

5. Installing erosion protection, if needed, where necessary to control soil erosion on steeper embankment areas; and

6. Revegetating the areas affected by construction for erosion protection and to minimize surface runoff.

While delineating the areal extent of surface soil/sediment contamination for the remedial design, the EPA determined that the area with wetland sediments having concentrations of contaminants above the ROD cleanup levels would not be remediated. The post RI/FS conducted by Ebasco concluded that a significant threat to human health and the environment does not exist and remedial actions for the wetland are not warranted, therefore, no action will be taken in the wetland area.

Although not considered during this phase of the work, the following two post-construction monitoring requirements will be addressed in the Remedial Design/Remedial Action Report (RD/RA), which will be prepared following construction.

1. Monitoring air quality at the site boundary before, during, and after the remedial action to confirm the control the VOCs; and

2. Post-closure monitoring of ground water, soil, Ox Creek sediments, and surface water.

1.5 Document Organization

The Design Plan has been organized into two volumes. Volume 1 - Pre-Design Sampling Results presents survey data, field observations, field monitoring, and laboratory analytical results. These data were used to develop the construction plan and the construction specifications and drawings. Volume 2 - Construction Plan, Specifications, and Schedule presents the construction plan, specifications, drawings, and implementation schedule for the remedial action.

Volume 1 of the Design Plan provides a detailed compilation of all data gathered during the pre-design sampling activities. Included are the surface soil/sediment and air sampling laboratory results, site surveying data, and ground water monitoring well observations. These data were used in conjunction with data from previous studies of the site to determine the limits of surface soil/sediment contamination and the condition of existing ground water monitoring wells.

In addition, Volume 1 provides a description of the components of the remedial design. The remedial design incorporates the data collected during field activities to develop grading requirements, air monitoring requirements during construction, and erosion control requirements.

Volume 2 presents the construction plan, specifications, drawings, and implementation schedule. The construction plan describes how construction will proceed to limit the chances of cross contamination and spreading of contaminants. For instance, clearing and grubbing will be performed first followed by placement of the soil cover. This sequence prevents equipment from working simultaneously in contaminated and uncontaminated areas and inadvertently tracking contaminated soils onto the clean soil cover. The construction specifications and drawings will be used as the basis for obtaining contract bids and controlling construction activities to meet the intent of the remedial design. The construction drawings provide a graphical description of how the remedial design is to be implemented and also present the remediation implementation schedule.

2.0 PRE-DESIGN SAMPLING RESULTS

Pre-design activities at the PAS Clothier site consisted of sampling and analyzing surface soil/sediments and borrow soils, air monitoring, site surveying, and evaluating the existing eleven ground water monitoring wells. The data obtained from these activities were utilized to develop the Remedial Design to comply with the ROD. Figure 2 illustrates the air monitoring locations, ground water monitoring well locations, and the area requiring remediation.

Sampling and analyses of the site surface soils/sediments were conducted to delineate the area of surface soil contamination requiring a one-foot clean soil cover. A borrow soil sample was also obtained and analyzed to verify a potential source of uncontaminated cover material for use during the remedial action. Air sampling and monitoring was conducted for VOCs and particulates to verify that there are no emissions from the site that could endanger the public and to provide air quality information for site health and safety protocols to be used during remedial construction. Surveying was conducted to develop a topographic base map of the area to verify placement of the one-foot thick soil cover following remediation and to record soil sample locations. The water level in the existing ten monitoring wells was measured and the wells purged to determine if they were silted in and whether or not they would be suitable for post-closure monitoring. The following sections discuss the results of the pre-design sampling from these activities.

2.1 Site Surveying

Surveyors from Modi Associates (Modi), Clay, New York, conducted surveys at the PAS Clothier site on July 11, 1989 and May 29, 1990. The surveys provided a detailed topographic map of the area requiring remediation and coordinates for the original 20 sample locations. The topographic map and coordinates are provided on Figure 3. Three sample locations were moved after the surveying was complete and eight sample locations added as a result of additional sampling. The coordinates for these points were

determined using measurements with a tape to the two nearest points with known coordinates.

The 20 initial sample locations were determined by evenly spacing 10 points on a rough circular pattern around RI sample locations 11, 15, 16, 17, and 24E. Since the coordinates for these five sample locations were unavailable at the time of the pre-design sampling, the existing stakes in the field were used to identify these points. Coordinates for the original sample locations 11, 15, 16, 17, and 24E have since been made available and obtained from the NYSDEC and were compared to the locations surveyed on May 29, 1990 by Modi Associates. Modi's surveyed locations 11, 15, 16, and 24E were all within 12 feet of the coordinates provided by NYSDEC for those sample locations. Since this distance is within the first 20-foot sample ring and well within the 50-foot sample ring, analytical results for samples obtained are sufficient for delineating the limits of surface soil/sediment contamination. The location established for point 17 during the pre-design sampling was approximately 28 feet north of the location identified by the NYSDEC. As shown on Figure 2, this provided a more conservative delineation of the limits of surface soil/sediment contamination as the sampling rings were actually established approximately 28 feet further to the north than required.

The NYSDEC Division of Fish and Wildlife identified the wetlands boundary at the PAS site during a site visit on May 30, 1990. Their personnel placed flagging along the wetlands boundary at approximately 30-foot intervals. The following day, May 31, 1990, Canonie located these points by measuring to two points with surveyed coordinates. The field measurements are provided in the Daily Field Activity logs in Appendix A. Coordinates were calculated for these points along the wetlands boundary and plotted to define the wetlands boundary on Figure 3. Field observations at each of the sample locations along the wetlands boundary also aided in identifying the wetlands boundary.

The coordinate system shown on Figures 2 and 3 was developed by surveyors for Canonie. This system is specific for the PAS site and is not tied to an existing coordinate system. It is different from the coordinate system

used by URS during its RI/FS, which was overlain onto Canonie's coordinate system using the monitoring wells, which have surveyed coordinates in both systems, as common points. This allowed Canonie to utilize existing data from the URS RI/FS. Canonie's coordinate system can be located in the field using the control points identified on Figure 2.

The survey data for the topographic map and sample location coordinates were used to define the limits of the soil cover and develop the grading plan and site cross sections. The topographic map was also used to estimate cut and fill quantities for the regrading. The grading plan indicates that approximately 1.3 acres will require 2,100 cubic yards (cy) of clean soil cover.

2.2 Surface Soil/Sediment Sampling and Analysis

Canonie collected 20 surface soil/sediment samples from the PAS Clothier site on May 30, 1990 at the locations shown on Figure 3. Ten of Canonie's surface soil/sediment samples were collected approximately 20 feet out from a roughly circular area created by five points (11, 15, 16, 17, 24E) identified in the ROD as having contaminant levels above one part per million (ppm) for PCBs or 0.330 ppm for CPAHs. Ten samples were also obtained approximately 50 feet out from the five points. Sampling in this pattern was intended to create concentric circles that would identify the lateral extent of soil and sediment contamination.

The soil/sediment samples were obtained by excavating with a stainless steel shovel to a depth of approximately six inches, scraping the sides of the excavation with a stainless steel spatula, placing the soil/sediment in a bowl, mixing placement of the sample in a 16-ounce glass jar, and packaging in a cooler for overnight shipment to Canonie's analytical laboratory in Stockton, California. The sampling equipment was then decontaminated prior to obtaining the next sample.

Detailed sampling and decontamination procedures are described in the "Work Plan - Revision 2, Pre-Design Sampling and Remedial Design/Remedial Action," April 1990. (Canonie, 1990). These procedures were followed to

provide a representative sample from each location and to prevent cross contamination between samples. Field activity logs, which describe sample collection and events, are presented in Appendix A.

All 20 soil/sediment samples, two field duplicates, and one rinseate blank were analyzed for semivolatiles and pesticides/PCBs in accordance with the Contract Laboratory Program-Scope of Work (CLP-SOW) for Organic Analysis (February 1988 revision) Target Compound List (TCL). The laboratory results for PCBs and CPAHs are summarized in Table 1. The validated laboratory results from these analyses and data validation reports are presented in Appendix B. Three sample locations on the outer ring (CES-12, CES-18, and CES-19) had concentrations or PCBs in excess of one ppm which is specified in the ROD as areas requiring cover. These results did not define the limits of surface soil/sediment contamination; thus, additional samples were collected outside of these three locations with exceedances.

On July 23, 1990, seven additional locations were sampled at the locations also shown on Figure 3. These seven locations were sampled and analyzed in the same manner as the previous 20 samples. Analytical results, summarized in Table 1 for PCBs and CPAHs, are presented in detail with the data validation reports in Appendix B. Laboratory results indicate that location CES-26 a the edge of the wetlands exceeded the one-ppm allowable level for PCBs in the surface soils.

The results of the two sampling rounds indicate that either a potential source area or "sink" may be located in the vicinity of sampling locations CES-6, CES-12, CES-7, CES-26. Additional analytical testing was conducted along the edge of the wetland on February 14, 1991 at location CES-35 to confirm the areal extent of surface soils with PCB levels above one ppm or CPAH levels above 0.330 ppm. Results from the surface soil/sediment analyses were used to delineate the area requiring clean soil cover.

The results of the soil/sediment analyses were then used to define the areal limits of contaminated soil. These limits of contamination were defined by connecting a line from each outer ring sample with PCB and CPAH concentrations less than one ppm or 0.330 ppm, respectively. As shown on

Figure 3, the areal extent of the soil/sediment contamination has been well defined. Approximately 1.3 acres of the site require a minimum of 1-foot-thick clean soil cover.

2.3 Borrow Soil Sampling and Analysis

Two potential off-site borrow sources were investigated during the pre-design sampling activities to identify a potential source of borrow material for use as soil cover and riprap for the remedial action. One borrow source is located on the property located directly east of the PAS Clothier site. The property has an operating pit consisting of sandy silt to silty sand material. This material is relatively fine grained and would serve as an acceptable source for supplying cover soil. A second borrow soil source is on property located approximately 6.5 miles northwest of the PAS Clothier site. This source was sampled but not further evaluated as a cover soil material due to its granular nature. This material consisted primarily of silty to sandy gravel. However, this site did contain numerous stockpiles of large rock, 3 inches to 12 inches in diameter, which would serve as acceptable riprap material, if needed. Both samples were collected from stockpiled areas and will require resampling and analyses by the contractor during the remedial action.

Analytical tests were performed on the sandy silt to silty sand borrow soil sample from the pit located east of the site. Chemical testing for TCL semivolatiles and pesticides/PCBs was performed in accordance with the CLP-SOW for Organics Analysis (February 1988 revision). The TCL analyses were conducted to verify that the potential borrow material was free of contaminants and could be used as "clean" cover material. Analytical results, provided in Appendix B, indicate that the soil sampled is free of TCL semivolatiles and pesticides/PCBs and may be acceptable for use as a soil cover at the PAS Clothier site.

Nutrient analyses were also performed on the borrow soil sample. The samples were analyzed for ph; total nitrogen; ammonia (as nitrogen); alkalinity as carbonate, bicarbonate, hydroxide, and total; nitrite (as nitrogen); and metals, iron, manganese, and potassium. The results of the

nutrient analyses are provided in Table 2 and were used to make preliminary estimates for the soil amendments for construction bidding purposes. Additional nutrient analyses will be required during construction to confirm the soil amendments specified.

2.4 Air Monitoring, Sampling, and Analysis

Real-time ambient air monitoring was conducted during the pre-design sampling activities on May 30, 1990 using an Organic Vapor Analyzer (OVA) for VOCs, a Random Aerosol Monitor (RAM) for dust particulates, and a Combustible Gas Indicator for oxygen levels. The results of this monitoring are presented in Table 3. In addition, ambient air samples were collected near the site perimeter (see Figure 2 for locations) and from a personal monitor worn in the active work area. These samples were analyzed for VOCs and particulates. The results of this monitoring are presented in Table 4. Air monitoring was conducted in order to ensure safe working conditions for personnel during the sampling activities and to verify that there are no VOC emissions from the site that could present a potential health hazard to the public.

Real-time air monitoring results are provided in Table 3. VOCs were detected with the OVA at four of the 20 soil/sediment sampling locations monitoring directly over the ground surface. However, no VOCs were detected by the OVA in the breathing zone (approximately three feet above the soil being sampled). Monitoring results indicate that no significant VOCs are being emitted from the area where sampling was conducted and that the site does not appear to pose a health hazard with regards to VOC emissions. Therefore, health and safety protocols should be used during pre-design sampling. Real-time ambient air monitoring, and downwind ambient air sample collection during construction will determine if additional protection is required as outlined in the contractor's Health and Safety Plan.

Particulates were also monitored in the active work area with a RAM. The test results are summarized in Table 3. The RAM only detected particulates at one time during the sampling activities at a very low level. Sampling activities were not conducive to generating dust due to heavy rain at the

site in the morning prior to monitoring and the small amount of activity on-site which could produce dust. During remedial action construction monitoring with the RAM will continue due to a higher probability of dust generation from the construction activities. This monitoring will be performed when construction activities include moving contaminated materials to verify that air particulate concentrations are maintained below 150 micrograms per cubic meter (ug/m^3) at the downwind site perimeter.

Air samples collected at the upwind and downwind site perimeter and a personal sample collected in the active work area were analyzed for VOCs. Sample analyses results are summarized in Table 4. The samples were collected and analyzed to verify that VOC emissions and airborne particulates at the site do not pose a health hazard to the off-site public. No VOCs were detected in the air samples collected at the site perimeter. Hexane (1.3 ppm) and acetone (0.9 ppm) at concentrations well below action levels of 2.5 ppm required for worker safety were detected in the aerosol monitor samples. Hexane and acetone were used during the decontamination of the sampling tools and are the likely source of these contaminants in the aerosol monitor samples. VOC sample results indicate that there is no apparent risk to the public from emission of VOCs from the PAS Clothier site.

Particulate samples were also collected at the upwind and downwind air monitoring locations. Sample results indicate only a slight increase in particulates from the upwind to the downwind sample locations (0.14 to 0.38 mg/m^3). Therefore, due to heavy vegetation, the gravel surfaced access road, and generally moist soil, it is not anticipated that dust generation at the site will pose a significant health risk to the public.

2.5 Ground Water Monitoring Well Evaluation

Nine of the eleven existing ground water monitoring wells at the PAS Clothier site were inspected during the pre-design sampling. The locations of the wells are shown on Figure 2. The wells were checked to determine their suitability for use during post-closure monitoring. Nine of the wells were visually examined for any damage near the surface, measured from

the top of the riser to the ground water to determine how much, if any, silt had accumulated in the casing, and bottom of the casing, and bailed to determine their ability to recover. Observations and measurements are summarized in Table 5 and the Daily Field Activity logs in Appendix A.

The protective casings on 10 of the 11 wells were rusted but in good condition with the exception of monitoring well CBW-2S which was dented and loose and will require replacement. In addition, the concrete surface plug for six of the wells (CBW-1S, CBW-1D, CBW-2S, CBW-2D, CBW-6, and CBW-7) was pushing up out of the ground from frost heaving. These seals should be replaced to ensure adequate protection of the well casing and to prevent surface water infiltration around the casing. Monitoring well CBW-6 had no lock or cap and will require such for future use.

The depth to the bottom of nine of the wells was measured and compared to the well completion details presented in the RI to determine if silt or debris has filled the bottom of the well casing within the screened section. Significant amounts of silt or debris within the well affect its performance in providing representative ground water samples for analyses. The field measurements indicate that silting has occurred in wells CBW-1S, CBW-1D, CBW-2D, and CBW-4S. Each of these wells has more than six inches of silt in the bottom. The silt presents difficulty in obtaining ground water samples for chemical analyses which are free of silt; therefore, these wells will require cleaning.

Water levels were measured for each of the wells prior to removing approximately two well volumes of ground water. Water levels were monitored at each of the wells after the two well volumes were removed until the original ground water elevation returned. All wells recovered within 15 minutes; therefore, it appears there are no problems with the well screen or the gravel pack.

Water level data were also used to verify the ground water gradient at the site to determine if wells are located in appropriate upgradient and downgradient areas for post-closure ground water quality monitoring and evaluation. As shown on Figure 2 and by the results presented in Table 5, ground

water flow is generally west to northwest across the site. A post-closure ground water monitoring plan will be developed and submitted with the RD/RA report as required by the Consent Decree. The ground water monitoring plan will identify the wells which will be monitored during post closure activities at the site.

3.0 REMEDIAL DESIGN

The Design Plan is based on the selected remedy in the ROD. Utilizing results from the pre-design sampling, additional detail was provided to refine the selected remedy and provide a detailed design for the remedial action. Several design evaluations were conducted to complete the remedial design including:

1. A grading plan for the area requiring soil cover to promote adequate drainage without causing erosion of the soil cover and an evaluation of the entire site to prevent drainage onto neighboring properties from the PAS Clothier site.

2. Erosion control to prevent erosion from a 24-hour, 100-year storm event; and

3. An evaluation of the existing ground water monitoring wells to determine their adequacy for use during post-closure monitoring requirements.

3.1 Grading Plan

The grading plan for the covered portion of the PAS Clothier site was designed to promote drainage away from the area of surface soil contamination while flattening slopes to prevent erosion of the soil cover. Approximately 800 cy of cut is required to prepare the area for the soil cover. The volume of cut was minimized to reduce the potential of exposing contaminated soils, which may have higher levels of contamination.

Material from clearing and grubbing, estimated to be approximately 60 cy, will be used to fill low areas and spread over the entire regraded area. The volume of clean soil cover placed over the regraded area is approximately 2,100 cy, resulting in a net volume of fill of approximately 2,160 cy.

Based on field observations and site topographic maps as shown on Figure 2, additional regrading of the site perimeter is not required. Runoff from the PAS Clothier site onto neighboring properties will not occur due to the existing site topography. Drainage from runoff and direct precipitation to the site is concentrated in the middle of the site and toward the Ox Creek wetland; however, it is minimal due to the small watershed contributing to this area. There were no visible signs of erosion in this area and due to the existing vegetation and specified vegetation on the soil cover, erosion is not expected in this drainage area after remediation has been completed. Additional details of the site drainage and erosion protection are provided in the following section.

3.2 Erosion Control

The erosion protection capabilities of the revegetated soil cover and the embankment along Ox Creek at the PAS Clothier site were evaluated. A 100-year, 24-hour storm event for Ox Creek was modeled to determine the extent of the flood and flow velocities along the western bank of Ox Creek at the site. Also, calculations were made to determine the overland flow velocities on the soil cover to determine the nature of erosive forces related to runoff.

Ox Creek, draining approximately 26 square miles, flows along the western edge of the soil cover. During a 100-year, 24-hour storm event, the extent of the floodplain will reach approximately the 360-foot contour, or approximately five feet above the base of the soil cover. However, flow velocities along the cover will be approximately 0.2 foot per second (fps). The revegetated cover is capable of withstanding flows of 4 to 6 fps before any erosion takes place. Therefore, the 100-year flood events occurring within Ox Creek will not adversely affect the soil cover.

The overland flow velocities over the soil cover were determined for the 100-year, one-hour storm event. Overland flow pertains to precipitation falling onto the revegetated soil cover and flowing over the cover as sheet flow. The maximum velocity over the revegetated soil cover was calculated to be a maximum 2.2 fps. This value is well below the permissible overland

flow velocities of 4 to 6 fps. Therefore, minimal erosion of the soil cover is expected to occur during the 100-year storm event.

Therefore, based on the above evaluations, erosion protection such as riprap armor is not required. The erosion protection provided by regrading and revegetation alone is sufficient to control erosion on the site.

Vegetation will be reestablished on the cover soil and other areas delineated as requiring revegetation in order to prevent soil erosion and reduce surface water flow to the Ox Creek wetland. The seed mixture specified for revegetation was recommended by the NYSDEC and confirmed with the United States Department of Agriculture and Cornell Cooperative Extension. The seed mixture, consisting of a mixture of broome grass, orchard grass, and a perennial rye grass, is similar to the existing vegetation and will be compatible with the wildlife on-site.

The surface water runoff pattern from the PAS Clothier site is toward Ox Creek and the adjacent wetland. No surface water runoff occurs from the site onto neighboring properties to the south and east. The existing site topography, as shown on Figure 2, shows that all precipitation and surface water run-on will drain away from the site perimeter and neighboring properties. Soil erosion on the PAS Clothier site will be eliminated by revegetating areas with little or no existing vegetation to prevent erosion and minimize surface water runoff towards Ox Creek and the adjacent wetland. The existing vegetation on-site currently reduces overland flow to the wetland and allows most of the surface water from precipitation and run-on to infiltrate the surface soils and evaporate or transpire through the vegetation. It will not be necessary to perform any regrading of the remainder of the site.

3.3 Ground Water Monitoring Well Design

Nine of the the existing eleven ground water monitoring wells were evaluated for their suitability for use during post-closure ground water monitoring. Details of the monitoring well evaluation are discussed in Section 2.5. It was determined that additional monitoring wells are not

required. Sufficient water quality data can be obtained from the existing wells to adequately monitor post-closure ground water conditions and determine if significant trends in ground water quality occur following remediation. However, several of the wells will require repairs as discussed in Section 2.5 to maintain their use during post-closure monitoring.

Ground water monitoring wells CBW-1S, CBW-1D, CBW-2D, and CBW-4S had more than six inches of silt in the bottom of the well casing. It was determined that these wells should be bailed to remove the silt until three inches or less remain in the well. This will allow sampling to be conducted without a significant amount of silt interfering with the laboratory analyses.

3.4 Permitting Requirements

A plan was developed and incorporated into the Construction Specifications to satisfy the permitting requirements for the remedial action at the PAS Clothier site. New York State, Oswego County, and the Town of Granby were contacted to determine the permitting requirements from each authority. The only permitting requirement is from the NYSDEC due to construction occurring within 100 feet of the wetland. The NYSDEC requires an Erosion and Sediment Control Plan outlining temporary erosion and sediment control measures to be utilized by the contractor to protect the wetland. The NYSDEC will review and approve the plan to meet the permitting requirements. No other permitting requirements were identified based on the proposed scope of work outlined in the Construction Specifications.

4.0 POST-CLOSURE MONITORING AND MAINTENANCE

Long-term ground water monitoring, Ox Creek sediment and surface water sampling, soil sampling, and air monitoring will be conducted as part of the post-closure monitoring. In addition, institutional controls will be applied at the site to prevent significant disturbance of the site involving excavation or removal of the soil cover. Details of post-closure monitoring and general site maintenance will be addressed in the RD/RA Report to be completed after EPA acceptance of the remedial action.

REFERENCES

REFERENCES

Canonie Environmental Services Corp. (Canonie), 1990, "Pre-Design Sampling and Remedial Design/Remedial Action Work Plan - Revision 4."

Ebasco Services, Inc., (Ebasco) 1988, "Final Supplemental Remedial Investigation Report," Clothier Disposal Site, Granby, New York.

Environmental Protection Agency (EPA), 1986, "SuperFund Remedial Design and Remedial Action Guidance."

Environmental Protection Agency (EPA) Region 2, 1989, New York, "Record of Decision," Clothier Disposal Site, Granby, New York.

Federal Emergency Management Agency (FEMA), Federal Insurance Administration, 1982, "Flood Insurance Study," Town of Granby, New York, No. 360650.

Fisher, D.W., Isachsen, Y.W., and Rickard, L.V., 1970, "Geologic map of New York State, Finger Lakes Sheet," New York State Museum of Science Service, Map and Chart series No. 15.

Freeze, R.A. and Cherry, J. A., 1979, "Groundwater," Prentice-Hall, New Jersey.

Isachsen, Y.W. and McKendree, W.G., 1977, "Preliminary Brittle Structures Map of New York," New York State Museum, Map and Chart Series No. 31.

Kantrowitz, I.H., 1970, "Groundwater Resources in the Eastern Oswego River Basin," New York, New York State Water Resources Commission Basin Planning Report ORB-2.

Muller, E.H., and Miller, T.S., 1980, "Surficial Geology of Part of Lysander Quadrangle," Oswego County, New York, USGS Water Resources Investigations, Open File Report 80-692.

National Oceanic and Atmospheric Administration (NOAA), 1981, "Airport Clinitological Summary for Syracuse, New York, Hancock International Airport."

National Oceanic and Atmospheric Administration (NOAA), 1985, "Local Climatological Data Annual Summary with Comparative Data for Syracuse, New York."

URS Company, Inc. (URS), 1987, "Remedial Investigation/Feasibility Study, Clothier, Town of Granby," Oswego County, New York.

TABLES

TABLE 1

CPAH AND PCB CONCENTRATIONS IN SURFACE SOILS/SEDIMENTS

CPAH	CES-1	CES-2	CES-3	CES-4	CES-5	CES-6	CES-7	CES-8	CES-9
Benzo(a)anthracene	ND	ND	ND	0.22	ND	ND	ND	ND	ND
Chrysene	ND	0.15	ND	0.24	ND	ND	ND	ND	.33
Benzo(b)fluoranthane	ND	ND	ND	ND	ND	ND	ND	ND	.15
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	.28
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total CPAH	ND	0.15	ND	0.46	ND	ND	ND	ND	.76
PCB									
Aroclor-1016	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248	ND	0.19	ND	ND	ND	1.5	0.32	ND	2.0
Aroclor-1254	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCB	ND	0.19	ND	ND	ND	1.5	0.32	ND	2.0

CPAH	CES-10	CES-11	CES-12	CES-13	CES-14	CES-15	CES-16	CES-17	CES-18
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total CPAH	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB									
Aroclor-1016	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248	2.4	ND	1.9	ND	ND	ND	ND	ND	2.5
Aroclor-1254	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCB	2.4	ND	1.9	ND	ND	ND	ND	ND	2.5

CPAH	CES-19	CES-20	CES-21	CES-22	CES-23	CES-24	CES-25	CES-26	CES-27	CES-35
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthane	ND	ND	ND	ND	ND	ND	ND	ND	ND	.035
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	0.16	ND	ND	ND	ND	ND	ND	ND	ND	.050
Total CPAH	0.16	ND	ND	ND	ND	ND	ND	ND	ND	.085
PCB										
Aroclor-1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND	ND	ND	ND	4.3	ND	ND
Aroclor-1248	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCB	1.8	ND	ND	ND	ND	ND	ND	4.3	ND	ND

Notes:
1. ND = not detected.
2. Concentrations in parts per million.

TABLE 2

BORROW SOIL NUTRIENT ANALYTICAL RESULTS

	Reporting Limit	Result	Units	Method
pH	---	7.8	---	EPA 9045
Ammonia (as nitrogen)	56	ND	mg/kg	AOAC 2.06
Total Kjeldahl nitrogen	56	220	mg/kg	AOAC 2.05
Alkalinity, bicarbonate (as $CaCO_3$)	5.6	18	mg/l	SM 403
Alkalinity, carbonate (as $CaCO_3$)	5.6	ND	mg/l	SM 403
Alkalinity, hydroxide (as $CaCO_3$)	5.6	ND	mg/l	SM 403
Alkalinity, total (as $CaCO_3$)	5.6	18	mg/l	Sm 403
Nitrate (as nitrogen)	1.1	ND	mg/l	EPA 300.0
Nitrite (as nitrogen)	1.1	ND	mg/l	EPA 300.0
Iron	11	10,900	mg/kg	EPA 6010
Manganese	5.6	330	mg/kg	EPA 6010
Potassium	560	760	mg/kg	EPA 6010

Note: ND indicates that a compound was not detected at a concentration higher than the reporting limit.

TABLE 3

REAL-TIME AIR MONITORING RESULTS

Soil/Sediment Sample Location	OVA Reading (ppm)		RAM Reading (ug/m3)	CGI Reading (% Oxygen)
	Soil	Breathing Zone		
CES-19	0	0		21.2
CES-9	0.6	0	0.00	21.4
CES-18	0.6	0		
CES-8	0	0	0.31	21.4
CES-17	0	0		
CES-7	0	0		
CES-12	0	0	0.00	21.3
CES-6	0	0		
CES-16	0	0		
CES-5	2.4	0		
CES-15	0	0	0.00	21.2
CES-4	0	0		
CES-14	0	0		
CES-3	0	0		
CES-13	0	0		
CES-2	0	0	0.00	21.3
CES-11	10-20	0		
CES-1	0	0		
CES-20	0	0		
CES-10	0	0	0.00	21.3

TABLE 4

AIR SAMPLE RESULTS

Analyte	Test Method	Concentration (ppm) Upwind	Downwind	Downwind Duplicate	Personal
2-Butanone	P&CAMS3	<.03	<.03	<.03	<.03
Benzyl chloride	1003	<.02	<.02	<.02	<.02
Bromoform	1003	<.02	<.02	<.02	<.02
Carbon tetrachloride	1003	<.06	<.06	<.06	<.06
Methyl chloroform	1003	<.04	<.04	<.04	<.04
Chlorobromomethane	1003	<.08	<.08	<.08	<.08
Chloroform	1003	<.04	<.04	<.04	<.04
o-dichlorobenzene	1003	<.02	<.02	<.02	<.02
p-dichlorobenzene	1003	<.02	<.02	<.02	<.02
1,1-dichloroethane	1003	<.02	<.02	<.02	<.02
1,2-dichloroethylene	1003	<.03	<.03	<.03	<.03
Ethylene dichloride	1003	<.02	<.02	<.02	<.02
Hexachloroethane	1003	<.03	<.03	<.03	<.03
Chlorobenzene	1003	<.02	<.02	<.02	<.02
Tetrachloroethylene	1003	<.03	<.03	<.03	<.03
1,1,2-trichloroethane	1003	<.04	<.04	<.04	<.04
1,2,3-trichloropropane	1003	<.02	<.02	<.02	<.02
Methylene chloride	1005	<.06	<.06	<.06	<.06
Acetone	1300	<.1	<.1	<.1	0.9
Cyclohexane	1500	<.01	<.01	<.01	<.01
Cyclohexene	1500	<.01	<.01	<.01	<.01
n-heptane	1500	<.01	<.01	<.01	<.01
n-hexane	1500	<.01	<.01	<.01	1.3
Methylcyclohexane	1500	<.01	<.01	<.01	<.01
n-octane	1500	<.009	<.009	<.009	<.009
n-pentane	1500	<.02	<.02	<.02	<.02
Toluene	1500	<.01	<.01	<.01	<.01
Benzene	1501	<.02	<.02	<.02	<.02
P-tert-butyltoluene	1501	<.02	<.02	<.02	<.02
Cumene	1501	<.02	<.02	<.02	<.02
Ethylbenzene	1501	<.009	<.009	<.009	<.009
Methylstyrene	1501	<.02	<.02	<.02	<.02
Naphthalene	1501	<.06	<.06	<.06	<.06
Styrene	1501	<.02	<.02	<.02	<.02
Xylene	1501	<.02	<.02	<.02	<.02
Total Dust (mg/m3)	0500	0.14	0.38	<.06	0.23

TABLE 5

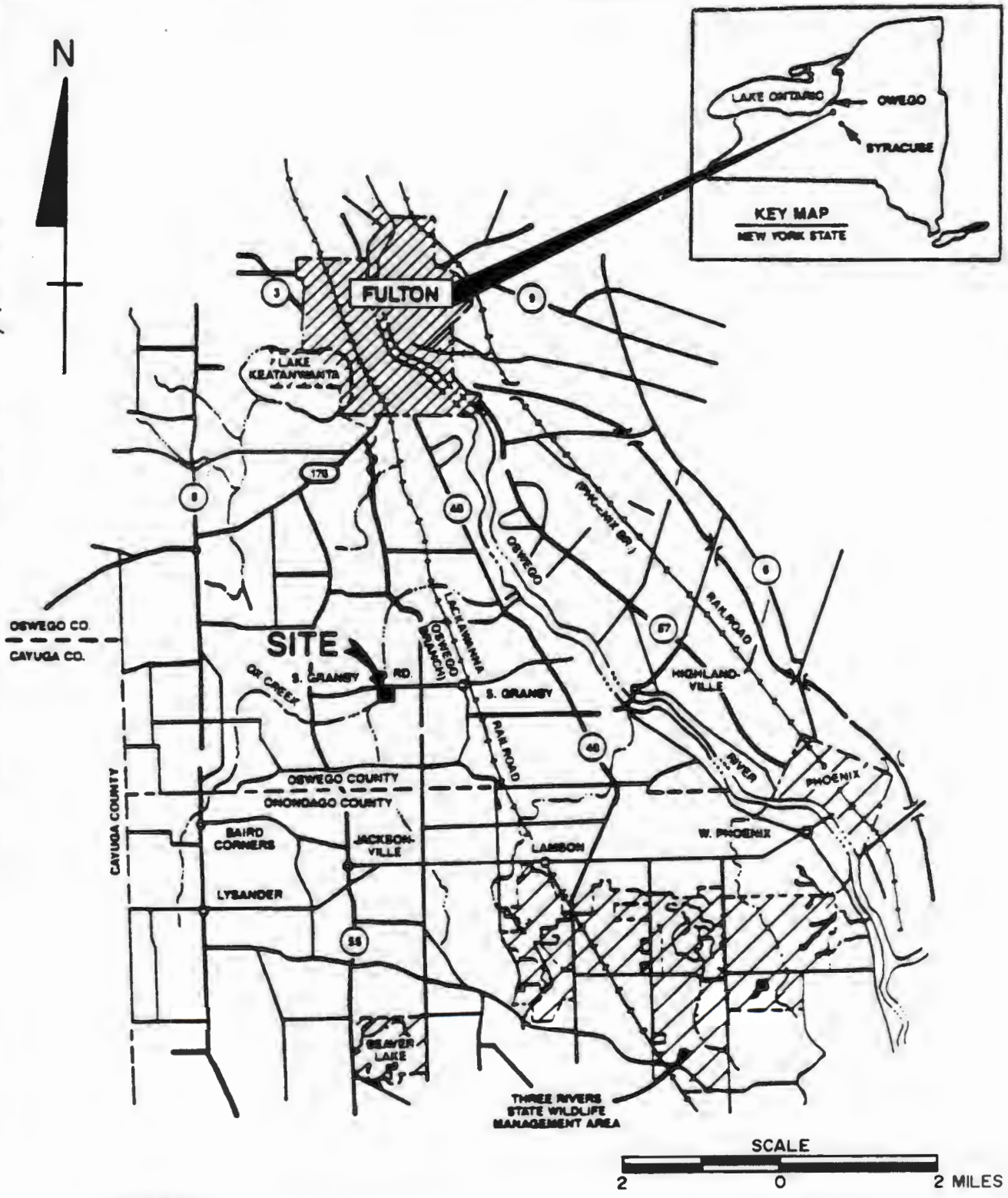
GROUNDWATER MONITORING WELL OBSERVATIONS

Well ID	Lock	Protective Casing	Surface Plug	Elevation of Groundwater (feet)	Measured Depth to Bottom of Casing (feet)	Original Depth to Bottom of Casing (a) (feet)	Comments
CBW-1S	Yes	Rusting	Damaged	360.3	34.8	35.7	Water silty, No well ID
CBW-1D	Yes	Rusting	Damaged	361.2	45.8	49.0	No well ID
CBW-2S	Yes	Rusting, Bent	Damaged	259.8	24.3	24.0	No well ID, Riser pipe bent
CBW-2D	Yes	Rusting	Damaged	359.0	34.0	36.5	No well ID
CBW-3	Yes	Rusting	Good	358.6	18.3	18.8	No well ID
CBW-4S	Yes	Rusting	Good	359.7	17.3	18.3	No well ID
CBW-4D	Yes	Rusting	Good	359.4	26.5	26.4	No well ID
CBW-6	No	Rusting	Damaged	360.9	23.1	22.6	No cap on casing, no well ID
CBW-8	Yes	Rusting	Good	360.6	25.4	25.7	No well ID

(a) From Ebasco Services Incorporated, "Final Supplemental Remedial Investigation Report, Appendix D, Monitoring Well Installation Reports," July 1988.

FIGURES

DRAWN BY	M.T.H.	7-21-89
CHECKED BY	CDW	8/3/89
APPROVED BY	CDW	8/3/89
DRAWING NUMBER	88-209-A6	



LEGEND:

■ PAS CLOTHIER DISPOSAL SITE

SITE LOCATION MAP

PREPARED FOR...

PAS CLOTHIER SITE
GRANBY, NEW YORK

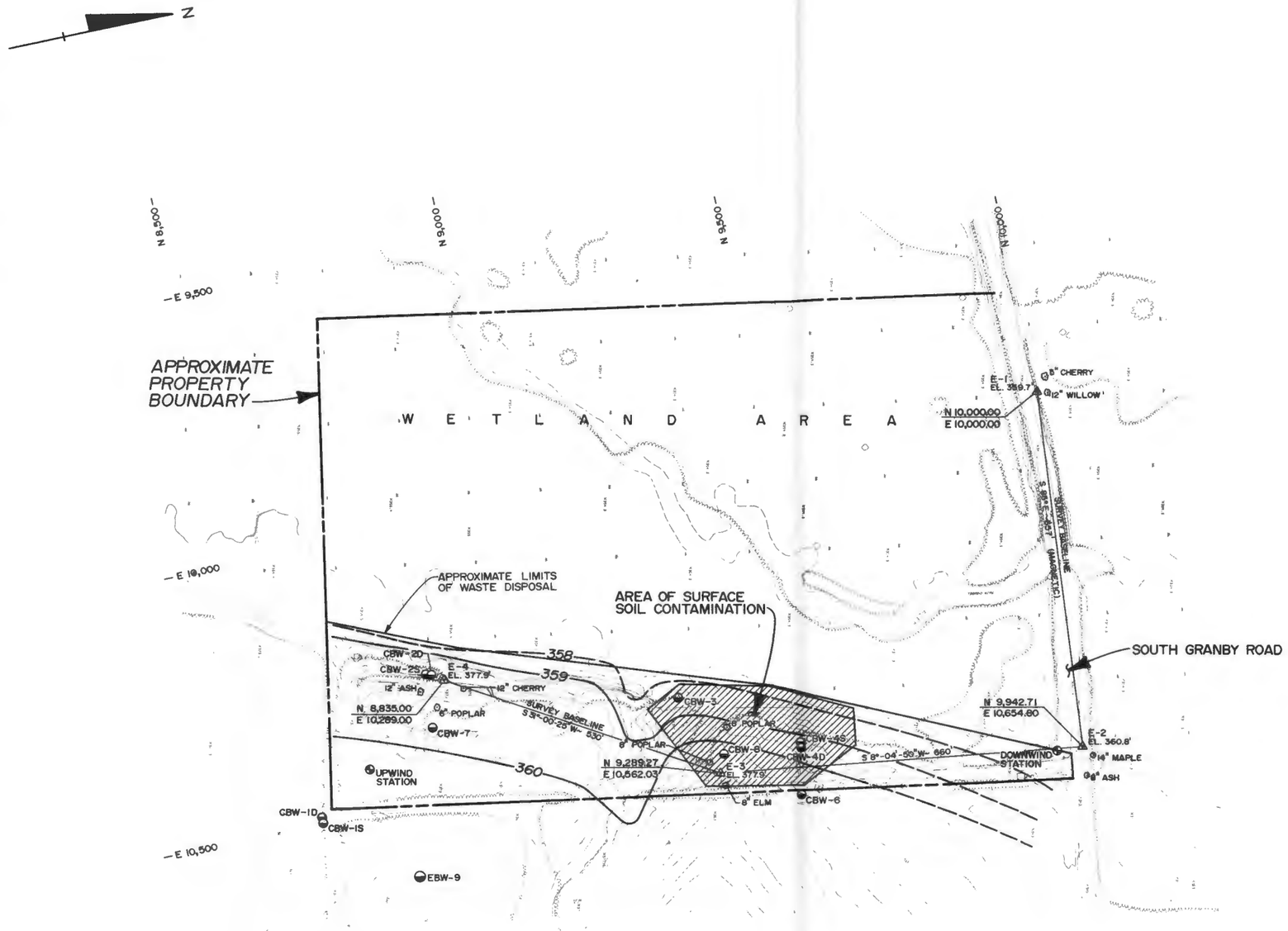
REFERENCE:
-DRAWING PROVIDED BY EBASCO, TITLED: "SITE LOCATION MAP."

CanonieEnvironmental

DATE: 7-21-89	FIGURE 1	DRAWING NUMBER 88-209-A6
SCALE: AS SHOWN		

88-209-E16

DRAWING NUMBER	88-209-E19
88-209-E15 9-7-90	
E15 E16	



MONITORING WELL COORDINATES (a)		
MONITORING WELL	NORTHING	EASTING
CBW-1D	8,565.0	10,487.3
CBW-1S	8,564.5	10,497.4
CBW-2D	8,814.4	10,274.4
CBW-2S	8,804.9	10,271.2
CBW-3	9,243.4	10,408.4
CBW-4D	9,441.8	10,545.9
CBW-4S	9,442.7	10,538.1
CBW-6	9,426.3	10,629.1
CBW-7	8,786.5	10,369.6
CBW-8	9,302.4	10,528.9
EBW-9	NOT AVAILABLE	NOT AVAILABLE

(a) COORDINATES WERE SURVEYED BY MODI ASSOCIATES, CLAY, NEW YORK ON MAY 29, 1990.

NOTE:

1. HORIZONTAL COORDINATES ARE REFERENCED TO A SELECTED PROJECT CONTROL NETWORK. VERTICAL ELEVATIONS ARE BASED ON THE UNITED STATES COASTAL AND GEODETIC SURVEY (USC&GS) MEAN SEA LEVEL DATUM OF 1929.

LEGEND:

- CBW-6 ⊖ GROUND WATER MONITORING WELL LOCATION AND DESIGNATION
- ⊕ AMBIENT AIR SAMPLING STATION LOCATION
- E-2△ BASELINE CONTROL POINT (REBAR) LOCATION AND DESIGNATION
- –360– POTENTIOMETRIC SURFACE CONTOUR, DASHED WHERE INFERRED (MAY 31, 1990)

SCALE
100 0 100 200 FEET

SITE PLAN

PREPARED FOR

PAS CLOTHIER SITE
GRANBY, NEW YORK

Canonie Environmental

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
2	6-17-91	ISSUED FOR REMEDIAL DESIGN PLAN	B.K.R.	SMK	DHG
1	5-14-91	ISSUED FOR AGENCY REVIEW	M.B.H.	SMK	DHG

REFERENCE:
COMPILED BY: LOCKWOOD SUPPORT SERVICES.
DATED: 3-26-86. SCALE: 1" = 50'.

9-7-90
88-209-E15

DATE: 9-11-90	FIGURE 2	DRAWING NUMBER 88-209-E19	2
SCALE: AS SHOWN			

88-209-E16

DRAWING NUMBER 88-209-E13

88-209-E12 M.B.H. 9-5-90

E12 to O

88-209-E10

WETLANDS BOUNDARY IDENTIFIED BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF FISH AND WILDLIFE ON MAY 30, 1990

TO OX CREEK

OUTER SAMPLING RING

INNER SAMPLING RING

LIMITS OF SURFACE SOIL CONTAMINATION

CES-14 ND (ND)
CES-15 ND (ND)
CES-16 ND (ND)
CES-25 ND (ND)
CES-23 ND (ND)
CES-24 ND (ND)
CES-4 ND (0.46)
CES-5 ND (ND)
CES-12 1.9 (ND)
CES-3 ND (ND)
CES-6 1.5 (ND)
CES-13 ND (ND)
CES-7 0.32 (ND)
CES-26 4.3 (ND)
CES-2 0.19 (0.13)
CES-17 ND (ND)
CES-35 ND (0.085)
CES-1 ND (ND)
CES-8 ND (ND)
CES-11 ND (ND)
CES-10 2.4 (ND)
CES-9 2.0 (0.76)
CES-18 2.5 (ND)
CES-20 ND (ND)
CES-19 1.8 (0.16)
CES-22 ND (ND)
CES-21 ND (ND)
CES-27 ND (ND)

CONCRETE PAD 388.46
CONCRETE PAD 369.31
CONCRETE PAD 371.33
DIRT ROAD

N9,500
N9,000
E10,500

SURVEY COORDINATES (a)

SAMPLE NUMBER	NORTHING	EASTING
CES-1 (b)	9207.0	10479.3
CES-2	9203.3	10453.6
CES-3	9238.3	10381.8
CES-4	9280.0	10377.7
CES-5	9358.4	10400.8
CES-6	9412.5	10428.3
CES-7	9448.1	10487.7
CES-8	9403.8	10526.4
CES-9	9338.1	10551.5
CES-10	9278.1	10518.9
CES-11	9174.5	10479.8
CES-12 (b)	9453.7	10427.4
CES-13	9196.1	10384.5
CES-14	9262.4	10343.3
CES-15	9336.9	10361.9
CES-16	9409.3	10393.5
CES-17 (b)	9455.5	10508.7
CES-18	9388.2	10566.2
CES-19	9300.2	10583.0
CES-20	9228.3	10525.6
CES-21 (c)	9324.8	10609.7
CES-22 (c)	9413.0	10622.5
CES-23 (c)	9473.4	10415.2
CES-24 (c)	9511.9	10417.5
CES-25 (c)	9445.5	10389.1
CES-26 (c)	9488.7	10487.3
CES-27 (c)	9278.2	10602.2
CES-35 (c)	9511.8	10515.8
11 (d)	9218.6	10485.5
15 (d)	9257.9	10398.9
16 (d)	9340.2	10543.6
17 (d)	9373.4	10519.7
24 (d)	9438.1	10488.5
24E (e)	9427.9	10483.6

(a) COORDINATES WERE SURVEYED BY MODI ASSOCIATES, CLAY, NEW YORK ON MAY 29, 1990.

(b) SAMPLE LOCATIONS WERE MOVED AFTER SURVEY WAS COMPLETED. THE COORDINATES WERE CALCULATED FROM MEASUREMENTS TO TWO SURVEYED POINTS.

(c) SAMPLE LOCATIONS FROM ADDITIONAL SAMPLING ON JULY 23, 1990 AND FEBRUARY 14, 1991. THESE COORDINATES WERE CALCULATED FROM MEASUREMENTS TO TWO SURVEYED POINTS.

(d) SAMPLE LOCATIONS BASED ON SURVEY COORDINATES PROVIDED BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.

(e) SAMPLE LOCATION BASED ON SURVEY COORDINATES PROVIDED BY MODI ASSOCIATES ON MAY 29, 1990. FOR THE STAKED LOCATION THAT WAS NOT PREVIOUSLY SURVEYED.

LEGEND:

- CES-20 CANONIE SURFACE SOIL SAMPLING LOCATION, MAY 30, 1990
- CES-21 CANONIE SURFACE SOIL SAMPLING LOCATION, JULY 23, 1990
- CES-35 CANONIE SURFACE SOIL SAMPLING LOCATION, FEBRUARY 14, 1991
- 1.8 CONCENTRATION OF PCBs IN SOIL (ppm)
- (0.16) CONCENTRATION OF CPAHs IN SOIL (ppm)
- 24E REM III BORING, OCTOBER 1987
- 16 NYSDEC SOIL BORING, FEBRUARY 1988
- WETLANDS

SCALE 25 0 25 50 FEET

REFERENCE:
TOPOGRAPHY PROVIDED BY MODI ASSOCIATES CLAY, N.Y. CHECKED BY DOUGLAS J. REITH, P.L.S. MAP TITLED, "TOPOGRAPHIC SURVEY" DATED: 1/88. REVISED: 8/90 SCALE: 1"=25'.

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
2	6-17-91	ISSUED FOR REMEDIAL DESIGN PLAN	B.K.R.	SMK	DHG
1	5-14-91	ISSUED FOR AGENCY REVIEW	P.M.W.	T.M.K.	D.H.G.

PRE-DESIGN SOIL SAMPLE LOCATIONS AND LABORATORY ANALYSES RESULTS

PREPARED FOR

PAS CLOTHIER SITE
GRANBY, NEW YORK

Canonie Environmental

9-5-90
88-209-E12

DATE: 9-6-90
SCALE: AS SHOWN

FIGURE 3

DRAWING NUMBER 88-209-E13 2

88-209-10

APPENDIX A

DAILY FIELD ACTIVITY LOGS

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surveying
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/29/90
SHEET 1 of 1

9:00 Arrive onsite

Doug Graves - Canonie
Tom Kreutz - Canonie
Modi (Surveyor)
Modi (Surveyor)

945 Modi began surveying

Located existing points 24E, 11, 15, 16, 17.

Surveyed existing points and also
20 canonie sampling points

1330 Modi completed surveying

Rain began to get heavy, no additional work performed

13:45 Left site

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME FAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface Soil Sampling
LOCATION Granby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 1 of 8

8 30 Arrive onsite
Doug Grawes - Canonie - DHG
Tom Kreutz - Canonie - TMK
Mohan Kumar - Ebasco - MK EPA Oversite
Mike Lane - HJA Associates - MAL Citizens Group

900 Galson Laboratories arrive onsite for air sampling
Mark Distler and William R. Handy

945 TMK returns with sample containers, coolers and DI water From Canonies Stockton Lab

10:20 Galson completes setting up air sampling equipment and meteorological station

10:20 TMK Completes calibrating air monitoring equipment
OVA calibrated with zero air and 8.8 ppm methane
CGI calibrated with pentane
RAM (particulate monitor) not field calibrated

TMK wearing personal monitors for organics and particulates
DHG wearing mini RAM

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface Soil Sampling
LOCATION Granby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 2 of 8

DHG
10:25 Begin surface soil sampling at location CES-19
Hard gravel conditions at surface
sample location 1' west of surveyed location
TMK monitoring with OVA
0 ppm above background (4 ppm background)
from soil
0 ppm in breathing zone
21.2% O_2 from CGI

1035 Sample 1a and 1b taken from location CES-19

1040 DHG decontaminates sampling equipment (spade, bowl, scoop) with Liqui-Nox & potable water, potable water rinse, acetone rinse, hexane rinse, DI water rinse.

1045 DHG begins sampling at location CES-9
hard brown clay conditions
TMK OVA 0.6 ppm off soil
0 ppm in breathing zone
21.4% O_2 CGI
0.00 ppm miniRam

1050 DHG takes sample 2a + 2b from location CES-9
MK takes a duplicate sample for Ebasco

10.55 DHG decons sampling tools

1100 DHG Begins sampling at location CES-18
TMK air monitoring w/ OVA
0.6 ppm off soil 0 ppm in breathing zone

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface soil Sampling
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 3 of 8

1105 ~~SA~~ DHG takes samples 3a and 3b from location CES-18
Hard brown clay, gravel removed from surface

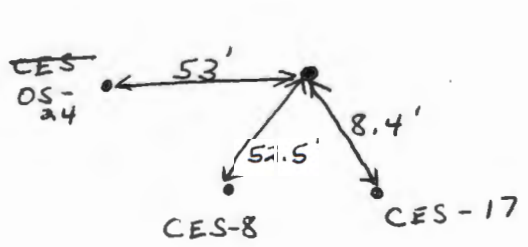
1115 DHG Decons sampling tools

1105 - 1115 TMK with Jack Cooper from the division of Fish and wildlife identifying the wetlands boundary

1120 DHG begins sampling at CES-8
Soft, brown clay
ML requested moving the surveyed sampling location ~1 ft to the north into a low drainage area, higher potential for contaminants.

1125 DHG takes samples 4a and 4b from location CES-8
TMK air monitoring
21.4 % O_2 from CGI
0.31 ppm from Miniram (particulates)
OVA 0ppm from soil 0ppm breathing zone

1130 Begin sampling at location CES-17
Moved Sample location to a low drainage area



Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface Soil Sampling
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 4 of 8

11:45 DHG Take Samples 5a & 5b from CES-17 ~~within wetland~~ TMK
Soft brown clay
TMK air monitoring
OVA 0 ppm above background from soil
0 ppm breathing zone
DHG Decon equipment

12:00 DHG Begin Sampling at CES ~~-17~~ 7
Soft Brown clay
TMK air monitoring
0 ppm OVA above background from soil
0 ppm, in breathing zone
Some debris, glass in soil

12:05 Samples 6a & 6b from CES-7

12:10 DHG Decon sampling equipment

12:45 TMK Begin Sampling at CES-12
Soft wet organic material
Sampling location in wetlands
made a cut in the soil and pulled shovel back and removed soil with sampling spoon from the cut.

12:55 TMK Samples 7a and 7B taken from CES-12
0 ppm from soil on OVA
0 ppm in breathing zone
21.3% O2 0 mg/m3 RAM

13.00 TMK Decon Sampling equipment

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface Soil Sampling
LOCATION Gromby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 5 of 8

13:15 TMK Begin Sampling at CES-6 within wetland
sample 4' west of surveyed point
Soft brown clay some organics on surface
water began seeping in
Sample location at edge of wetland
13:20 TMK Take samples 8a and 8b from CES-6 OVA OPPM from soil OPPM breathing zone
Ebasco took duplicate sample
13:30 TMK Decon sample equipment
13:45 TMK Begin Sampling at station CES-16 within wetland
Soft dark brown clayey organic material
roots in sample
OVA: OPPM soil OPPM breathing zone
13:50 TMK Samples 9a and 9b taken from CES-16
13:55 TMK Decon Sampling equipment
14:15 DHG Begins Sampling at CES-5 within wetland
Dark brown to black organic, wet soil
14:20 DHG Samples 10a and 10L taken from CES-5
samples 11a and 11b taken from CES-5 as a
Field duplicate
OVA 2.4 ppm from soil - very organic
0 ppm in breathing zone
readings above background
14:25 DHG Decontaminate sampling tools

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface soil Sampling
LOCATION Granby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 6 of 8

DHG,
14:30 Begin sampling at CES-15 - within wetland
Dark brown organic material -
14:40 DHG takes samples 12a and 12b from CES-15
14:45 DHG Recons sampling equipment
0 ppm OVA from soil 0 ppm breathing zone
21.2% O_2 0 mg/m^3 RAM
14:50 DHG Begins sampling at CES-4 outside of wetland
Dark brown wet clay - some roots and organics
14:55 DHG Takes samples 13a and 13b from CES-4
0 ppm from OVA from soils 0 ppm breathing zone above background
15:00 DHG Recons sampling equipment
15:10 DHG begins sampling at CES-14 within wetlands
Dark brown organic material
15:15 DHG Takes samples 14a and 14b from CES-14
0 ppm above background from soils on OVA
15:20 DHG Recons equipment
15:30 DHG begins samplin at CES-3 outside wetlands
Brown clay
15:35 DHG Takes samples 15a & 15b from CES-3

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface Soil Sampling
LOCATION
DAILY ACTIVITIES AND EVENTS:

DATE 5/30/90
SHEET 7 of 8

15:40 DHG Decons sampling equipment
OVA monitoring 0ppm soil 0ppm breathing zone
15:45 DHG begins Sampling at CES-13
moved 6' west to a low spot in drainage outside of wetlands area
OVA monitoring 0ppm soil 0ppm breathing zone
15:50 DHG takes samples 16a & 16b from CES-13
15:55 DHG begins decomin sampling equipment
16:00 DHG takes a rinsate sample 30a
16:05 DHG begins sampling at CES-2
16:10 brown clay - some moisture
DHG takes samples 17a and 17b from CES-2
Duplicate sample for Ebasco
OVA monitoring 0ppm soil 0ppm breathing zone
16:15 DHG Decons Sampling equipment 0mg/m³ RAM, 21.3% CGI
Rinsate sample for Ebasco
16:20 DHG begins sampling at CES-11
Brown clay
10-20 ppm off soils OVA above background
yellow tar substance in excavation, 0ppm breathing zone
16:35 DHG takes samples 18a and 18b from CES-11
and 19a and 19b from CES-11 as a duplicate
16:40 DHG begins decon sampling equipment
Rinsate sample 30b

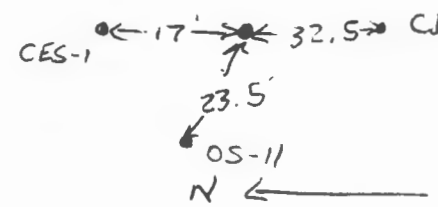
Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Surface soil Sampling
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE
SHEET 8 of 8

16:45 DHG ~~DGH~~ begins sampling CES-1
moved sampling location to a low drainage area
OVA monitoring
0ppm soil,
0 ppm breathing zone



16:50 DHG takes samples 20a and 20b from CES-1
16:55 DHG Decons Sample equipment
17:00 Rinsate Sample 30C

17:05 DHG begins sampling CES-20
light brown sandy silt some fill
OVA monitoring 0ppm soil, 0ppm breathing zone
17:15 DHG takes samples 21a and 21b from CES-20

17:20 DHG decons sampling equipment

17:20 DHG takes rinsate sample 30d

17:25 DHG begins sampling CES-10
light brown sandy silt some clay
OVA monitoring 0ppm soil 0ppm breathing zone; 0 mg/m³ RAM, 21.3% O2
17:30 DHG takes samples 22a & 22b from 10 carbon CGI

CES-10

17:35 Personal monitor removed - sampling complete

18:00 Pack Samples, leave site.

OCP-TCL
BNA-TCL

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT & Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 1 of 8

830 Arrive onsite
Doug Grames Canonie
Tom Kreutz Canonie
Mohan Kumar Ebasco

920 Monitoring well Evaluation

well no. CBW-6

Depth to water 16.4' to top of casing
23.1' from top of casing to bottom
2" dia ss casing

well cover has no lock, no cap on casing
well cover tied shut with survey tape
well plug (concrete plug at surface) is mushrooming (Frost heaving has pushed the concrete plug out of the ground) ~ 6" above ground surface.

3.2' from concrete plug to top of protective casing.
Protective cover in good shape - rusting
Water is silty, bailed 4 ~~bailer~~ bailer TMV volumes
ss bailer (0.125' dia x 3' length)
930 complete bailing
935 water level ~~elevation~~ depth 16.6' from top of casing

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 7 of 8

Well CBW 4S

12.5' depth of water to top of casing

17.3' total depth to top of casing

removed 3 bailer volumes 9:42

9:44 ~~12.5~~ 13.15

protective casing plug ~3" around casing - at ground surface - no mushrooming - rusting

12.5' at 9:49

protective casing 2.7' above ground surface

Well CBW 4D

12.2' depth of water to top of casing

36.5' depth to bottom of well from top of casing

water silty, dirty

removed 9 bailer volumes 9.59

protective casing plug ~3" around casing - at ground - no mushrooming

well casing in good shape - rusting

17.6' depth 10:01

protective casing 2.7' above ground surface

16.5' depth @ 10:05 depth of water

14.8' depth @ 10:09 depth of water

12.4' depth @ 10:24 depth of water

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 3 of 8

CBW-8

17.5' depth of water to top of casing
25.4' total depth to top of casing
removed 5 bailer volumes 10:17
water very dirty with silt

17.7' at 10:20 depth of water
17.5' at 10:21 depth of water
concrete surface seal, good condition

CBW-3

4.0' depth of water to top of casing
18.3' depth to bottom from top of casing
water dark reddish brown - silty
water getting better - less silty by 4th bailer
12 bailer volumes removed 10:38
5.3' at 10:39 depth to water
4.5' at 10:40 depth to water
4.4' at 10:41 depth to water
2.85' from ground to top of protective casing
no mushrooming from plug - plug in good shape
protective casing in good shape - rusting

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 4 of 8

CBW-2S

14.6' depth to water from top of casing
24.3' depth to ~~water~~ bottom from top of casing

plugged or bent at ~5' depth - unable to get a bailer into the well
outer protective casing dented and loose
plug mushrooming
protective casing dropped while investigating

CBW-2D

15.4' depth to water from top of casing
34.0' depth to ~~well~~ bottom from top of casing

~~34.0' depth to bottom~~

water clean at the top (first bailer)
some silt in water
concrete plug mushrooming pulling protective casing up ~0.3'
Removed 12 bailer volumes - water has some silt 11:14
17.2' depth to water 11:16
2.5' from ground to top of protective casing
15.8' depth to water 11:19

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 5 of 8

CBW 1D (~~not~~ west of CBW 1S)

26.0' depth to water from top of casing
45.8' depth to bottom from top of casing

1.5" x 5.0' bailer already in well

water clean - no silt in first bailer
second bailer - water is dirty - silty - reddish brown
water becoming clean after 6 bailers removed
8 bailers removed 11:40

26.0' depth to water from top of casing 11:42
2.25' from concrete plug to top of protective casing
concrete plug has mushroomed about 1" out of ground
prot. casing in good condition - rusting

CBW 1S (east of CBW 1D)

27.6' depth to water From top of casing
34.8' depth to bottom from top of casing

water from first bailer very silty - reddish brown
bailed 5 bailer volumes water still very silty
11:50

27.6' depth to water from top of casing 11:53
2.35' from concrete plug to top of protective casing
slight mushrooming of protective concrete plug

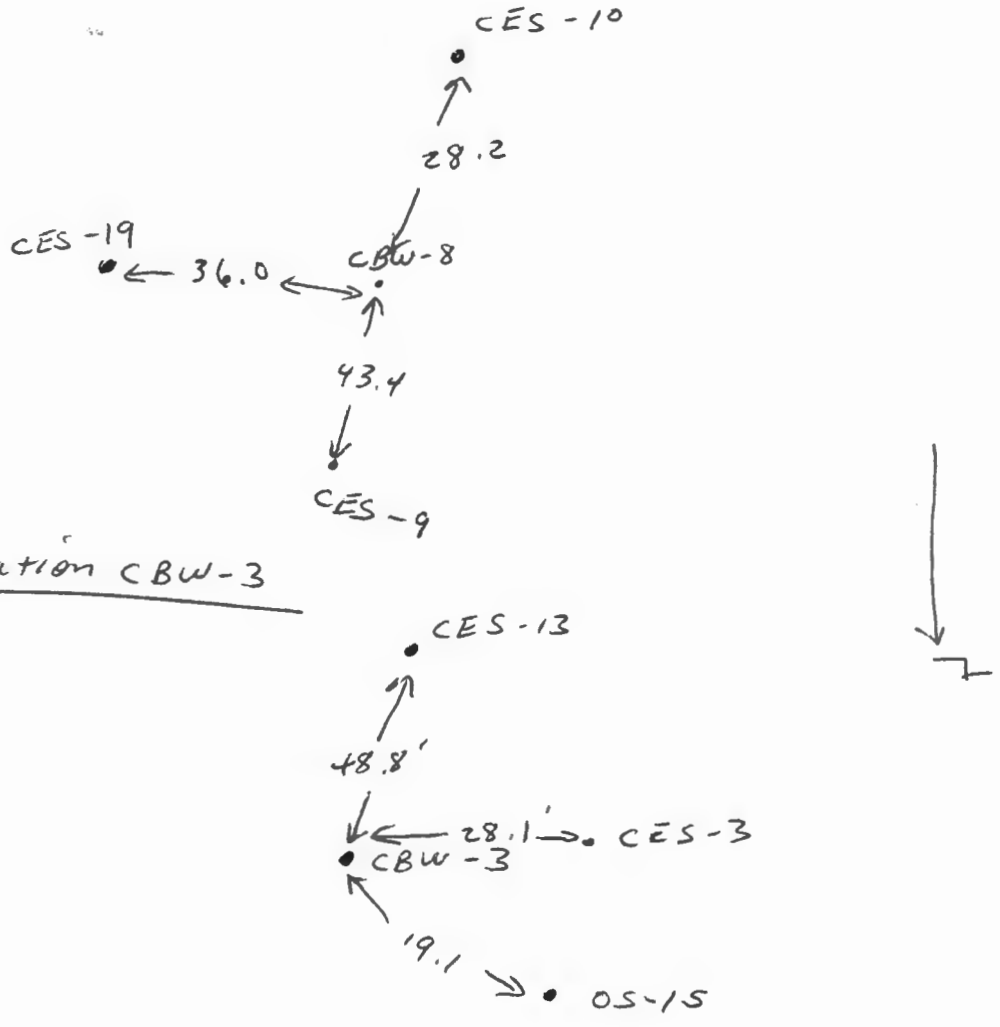
Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 6 of 8

Location CBW-8



Location CBW-3

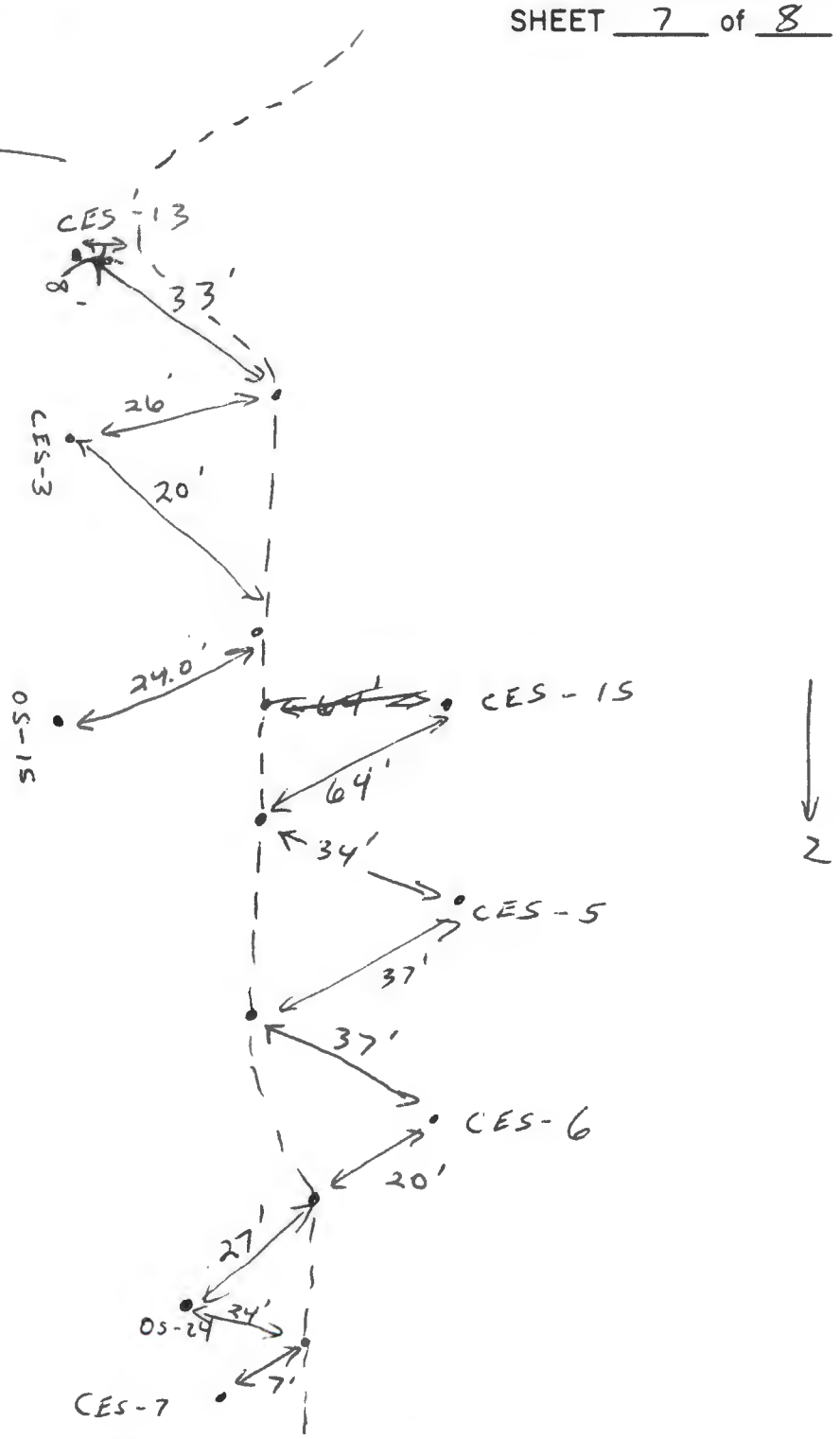
Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Monitoring Well Evaluation
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 7 of 8

wetlands Survey



Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Borrow soil Sampling
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 5/31/90
SHEET 8 of 8

1300 leave site and attempt to locate a borrow source.

1830 TMK Sample borrow source - Mike Petro, 6.5 miles from site
silty sand some gravel

1900 TMK Sample borrow source on property adjacent to the PAS Clothier site to the ~~south~~ east TMK.
sandy silt

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 1 of 6

1100 Arrive onsite and meet:
Mohan Kumar - Ebasco
Mike Lane - TAG
Jim Pagano - TAG

1130 Establish new sampling points with MK
Discuss sampling points with ML, no requests to move sample locations.

1200 Decontaminate sampling tools:
SS shovel, ss bowl, ss spoon

Decon procedure
- water and nonphosphate detergent (Liquinox) wash
- Rinse with water
- Rinse with Acetone
- Rinse with Hexane
- Rinse with DI water from Canonie Lab.

1215 Begin sampling at CES-26 - in wetlands
Brown clay, some organics

1235 Take sample 50a and 50b from CES-26

1240 Decon equipment

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 2 of 6

1245 Begin sampling at CES-23
Wet organic material, saturated
MK indicated that samples with >50% moisture may be rejected by EPA.
No other sampling methods available, sample taken.

1320 Sample 51a and 51b taken from CES-23

1330 Decon sampling equipment
Rinseate Sample 60a

1340 Begin Sampling at CES-24
Clayey silt, some organic material
In wetlands

1345 Take sample 52a and 52b from CES-24
MK, Ebasco, took a duplicate

1355 Decon equipment

1405 Begin sampling CES-25
Brown Clay, some organic material
Location in wetlands

1410 Take sample 53a and 53b from CES-25

1415 Decon equipment
Rinseate sample to Ebasco - 1 ℓ

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 3 of 6

1425 Begin sampling at CES-27
Light brown silty clay - little or no organic material

1435 Take Sample 54a and 54b from CES-27 and duplicate 57a and 57b from CES-27

1445 Decon equipment
Rinsate sample 60b

1450 Begin Sampling at CES-21
Light brown clay, dry

1455 Take sample 55a and 55b from CES-21

1500 Decon equipment
Rinsate sample 60c

1510 Begin sampling at CES-22
Soft brown silty clay
no organics

1520 Take sample 56a and 56b from CES-22

1525 Decon equipment

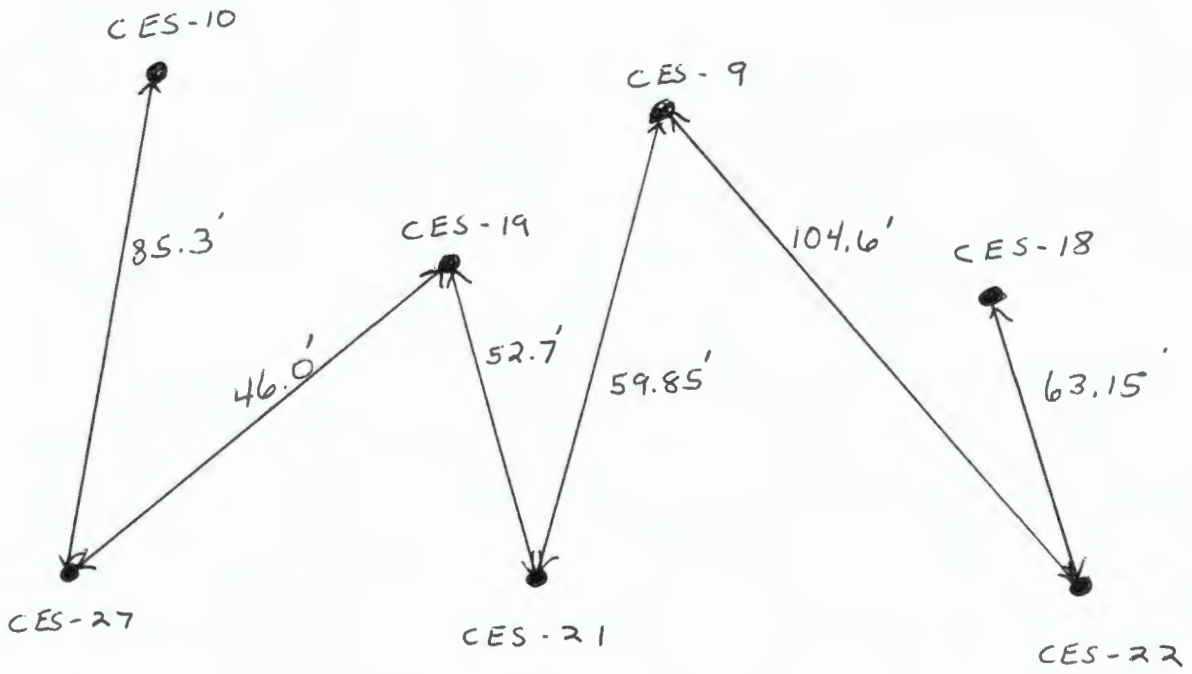
1530 Begin taping new sampling locations with MK

Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 4 of 6

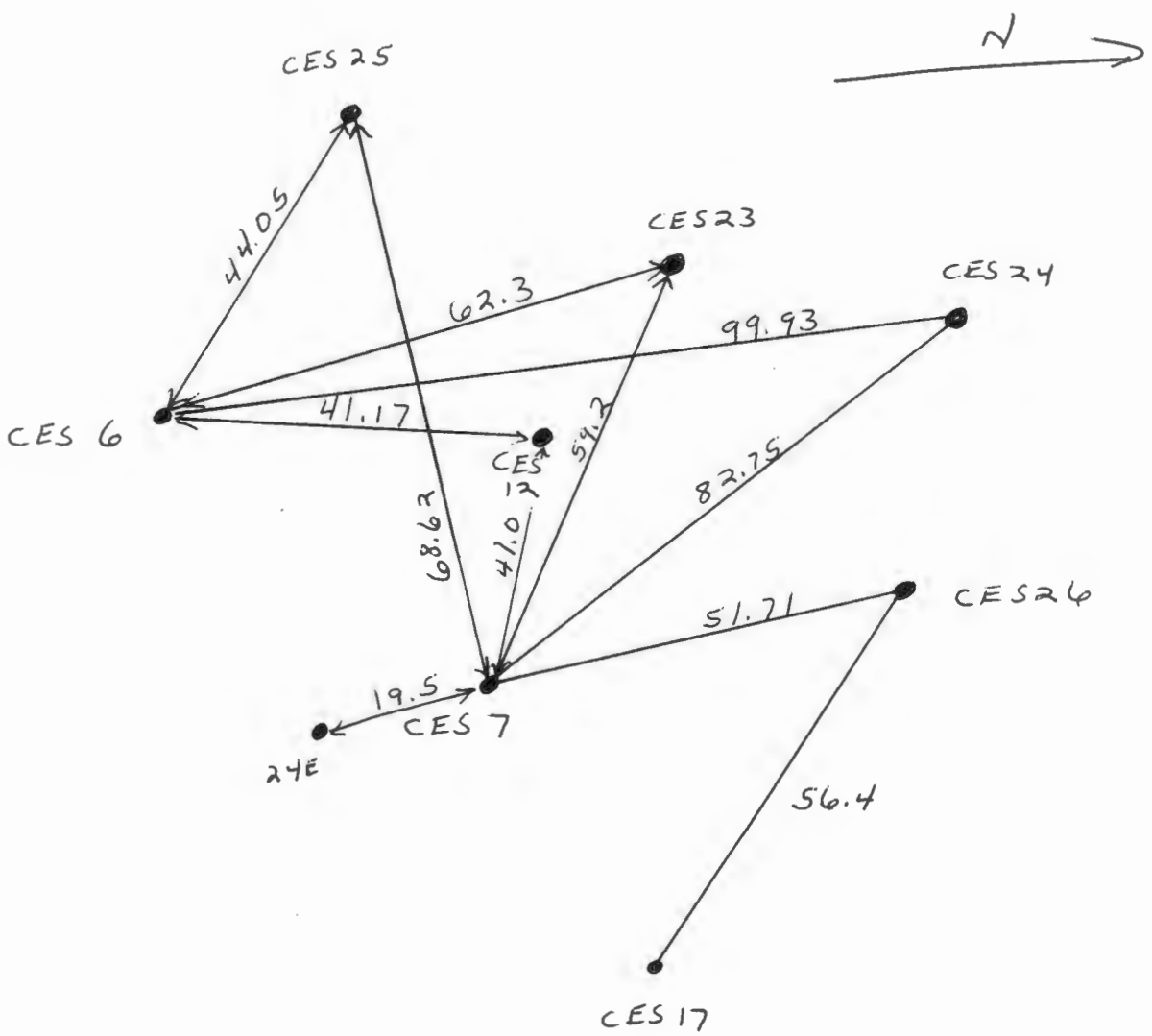


Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 5 of 6



Canonie

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209
FIELD ACTIVITY SUBJECT Additional Soil Sampling
LOCATION Granby NY
DAILY ACTIVITIES AND EVENTS:

DATE 7/23/90
SHEET 6 of 6

1615 Completed survey
Begin packaging samples for shipment

1700 Richard Clothier onsite to see why the gate was open - then left.

1800 Leave samples from first phase of sampling in a cooler in the shed near the gate.

1830 Leave site

1930 ship samples via Federal Express

CanonieEnvironmental DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88-209-01
FIELD ACTIVITY SUBJECT South Area Sampling
LOCATION Granby New York
DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91
SHEET 1 of 7

7:10 arrive onsite to pickup water container, container and lath left onsite was gone

2 new drums onsite near drum with used clothing

720 Reestablish previous sampling points CSLS-8, CSLS-9, CSLS-20

800 Leave site to pickup supplies

1010 Arrive back at site and meet Jim Ashe - EBASCO, EPA oversight contractor

News team from channel 3 in Syracuse also present and seeking access to site to film sampling

News team denied access due to their lack of required OSHA Health and Safety training.

I told crew that they could film sampling from outside the property boundary of the site.

1030 Begin previous sample layout. locate CSLS-6, CSLS-25

1100 Sandy Weston, FSDWAC and Newscrew arrive outside property boundary on east side of site I told Sandy that unless she had 40 hr Health and Safety training, she could not be allowed onsite

CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 8820901

FIELD ACTIVITY SUBJECT South Area Sampling

LOCATION Granby New York

DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91

SHEET 1 of 7

1115 Paul Fleming, GE, Mike Lane HJA, NYSDEC

Discuss who is allowed onsite

Mike Lane, no 40 hr training, will be allowed to help layout new sampling locations

1130 Begin layout of new sample locations

Mike Lane would like to have berm samples located on west side of berm instead of directly ontop of berm.

1240 Begin Sampling

Jim Ashe noted 2 items

1) Unable to verify our DI source
   DI water from Canonie Stockton laboratory, source previously tested for project.

2) Acetone is Analytical reagent grade instead of Pesticide grade
   Pesticide grade Acetone was unavailable from local source.

Sample at location CES-33 using Soil Recovery Probe (SRP) with stainless steel liners (3/4" ø x 12" long) (samples taken from 0 - 12 inches)
Rinse liners with DI water before using.

obtain 4 liners.

Decon - water and non phosphate detergent, Acetone, Hexane, DI water

CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 882C901
FIELD ACTIVITY SUBJECT South Area Sampling
LOCATION Granby, New York
DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91
SHEET 3 of 7

1255 Sample CES-33

1320 Sample CES-34 SRP

1345 Begin sampling at location CES-32 in berm. Material is very organic, mostly vegetation pushed into a pile, Move to location west side of berm. Due to organic material, poor soil recovery using SRP
change to SS spade and bowl to obtain sample
Sample depth 0-10".
Fill 2-4 oz glass bottles

1415 Sample CES-32 EBASCO duplicate

~~1445~~ 1510 Sample CES-30 SS Spade
Field duplicate identified as CES-36

1500 Rinseate sample 37A (1 liter) after sampling CES-30

1510 Sample CES-29 SS Spade

1524 Rinseate Sample 37B (1 liter) after sampling CES-29

1535 Sample CES-31 SS spade

1543 Rinseate sample 37C (1 liter) after sampling CES-31
Ebasco Field Blank (Rinseate)

1556 Sample CES-28 SS Spade

1625 Sample CES-35 SS Spade
North end of site

~~1645~~ 1700 Begin locating points

CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 882C901

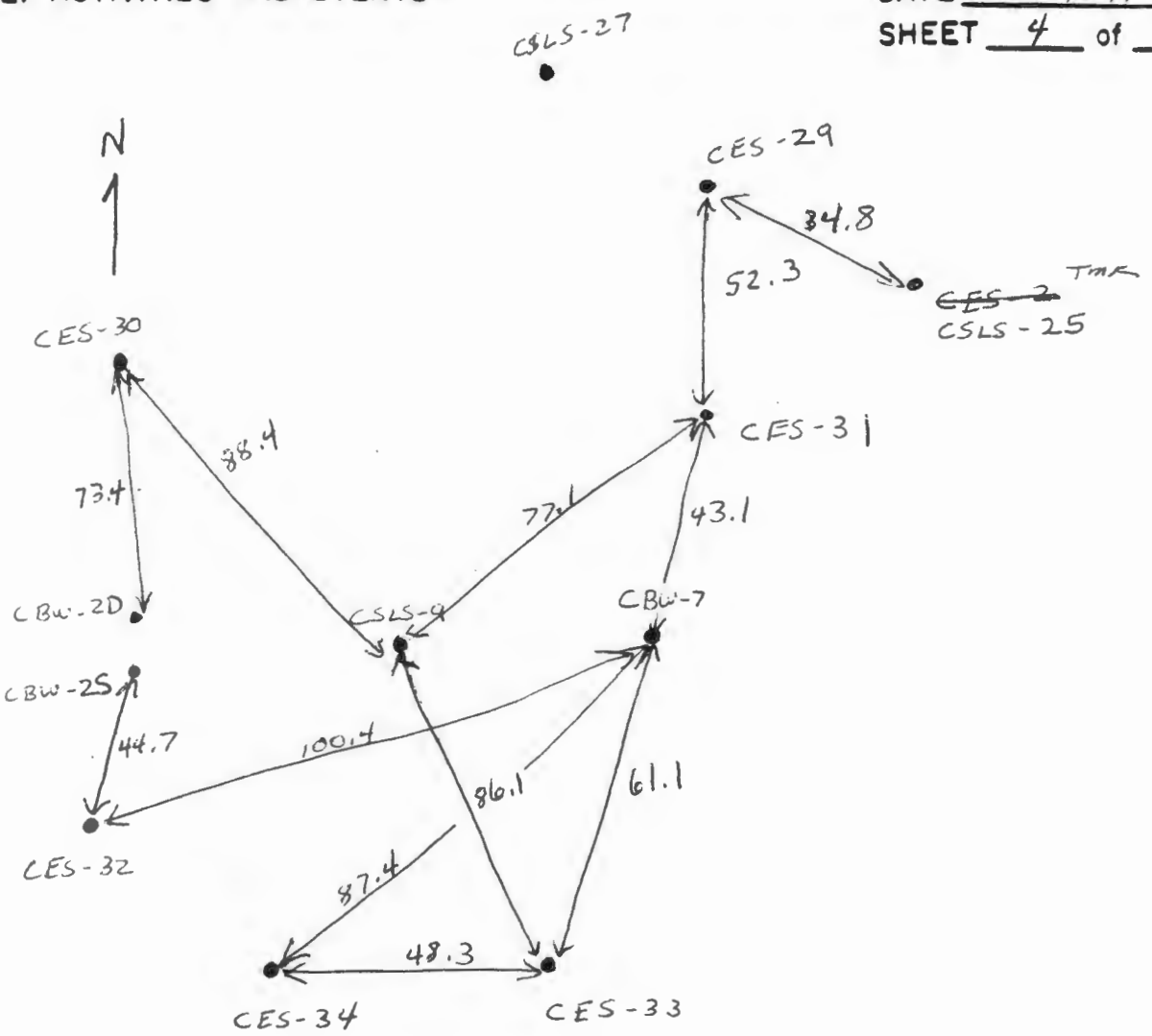
FIELD ACTIVITY SUBJECT South Area Sampling

LOCATION Granby New York

DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91

SHEET 4 of 7



DT	PT	Dist	PT	Dist
CES - 33	CBW-7	61.1	CSLS-9	86.1
CES - 34	CBW-7	87.4	CES-33	48.3
CES - 31	CBW-7	43.1	CSLS-9	77.1
CES - 29	CES-31	52.3	CSLS-25	34.8
CES - 30	CSLS-9	88.4	CBW-2D	73.4
CES - 32	CBW-25	44.7	CBW-7	100.4

CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 8820901

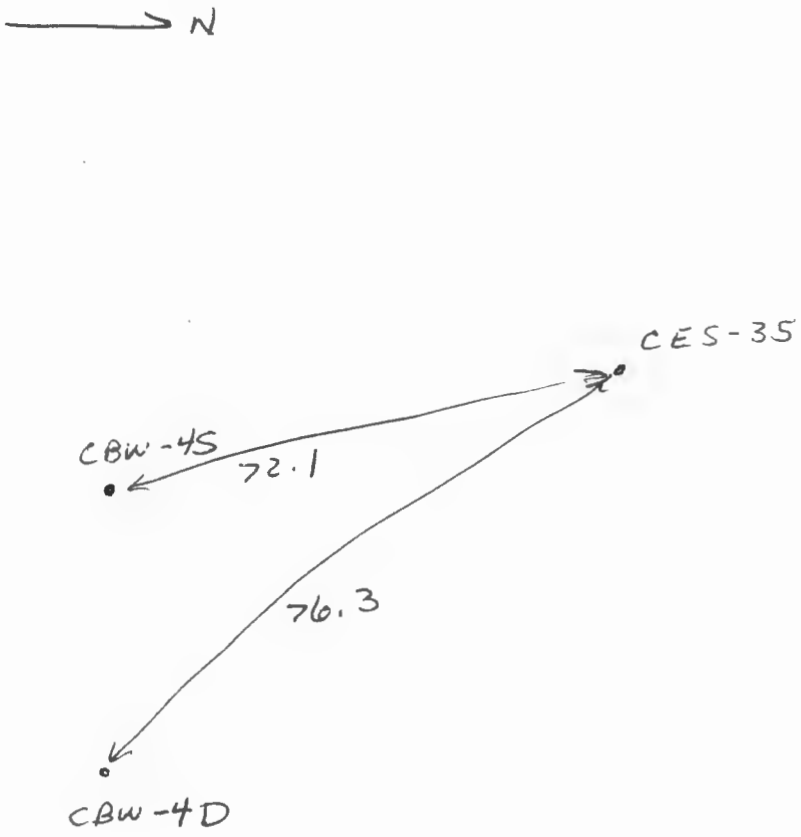
FIELD ACTIVITY SUBJECT South Area Sampling

LOCATION Granby New York

DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91

SHEET 5 of 7



CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 882091

FIELD ACTIVITY SUBJECT South Area Sampling

LOCATION Goomby, New York

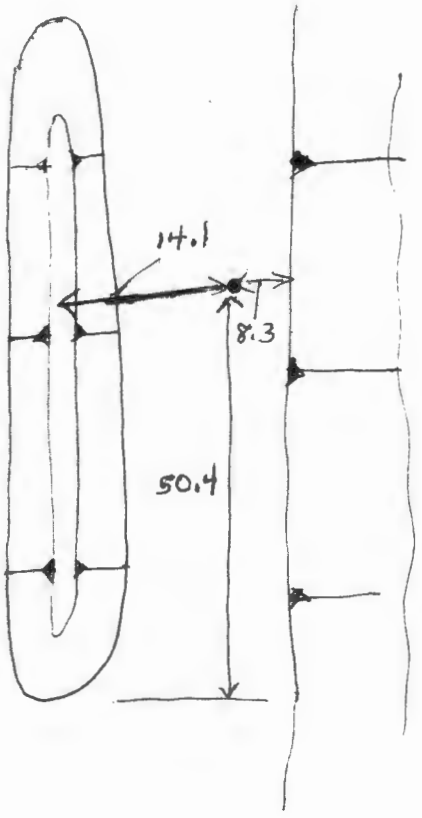
DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91

SHEET 6 of 7

N

Unable to measure to two known points to locate CES-28



Ox Creek Floodplain

CanonieEngineers

DAILY FIELD ACTIVITY LOG

PROJECT NAME PAS Clothier PROJECT NO. 88209C1

FIELD ACTIVITY SUBJECT South Area Sampling

LOCATION Granby New York

DAILY ACTIVITIES AND EVENTS:

DATE 2/14/91

SHEET 7 of 7

Clean samples and site

1800 Leave site lock gate

1830 - 2015

Label sample containers

Place custody seals on bottles

Pack Samples

2100 Federal Express Samples to Stockton laboratory

APPENDIX B

LABORATORY ANALYSES RESULTS AND DATA VALIDATION REPORTS

LABORATORY ANALYSES RESULTS

The validated results from the laboratory analyses are tabulated in the following table. Table B-1 presents results from the Semivolatile analyses and Table B-2 presents results from the Pesticides/PCB analyses.

TABLE B-1

NORTH AREA
SEMIVOLATILE LABORATORY RESULTS

EPA Sample No.	01B	02B	03B	04A/B	05B	06B	07B	08B	09B	10B	11B	12B	13B	14B	15B	16B
Sample Location	CES-19	CES-9	CES-18	CES-8	CES-17	CES-7	CES-12	CES-6	CES-16	CES-5	CES-5	CES-15	CES-4	CES-14	CES-3	CES-13
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Analytes:																
Phenol	16000	5800	7300	410 U	420 U	2800	4900 UJ	6200	950 J	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	116 J
bis(2-Chloroethyl)Ether	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2-Chlorophenol	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
1,3-Dichlorobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
1,4-Dichlorobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzyl alcohol	760 UR	730 U	810 UR	410 UR	420 UR	870 UR	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UR	2700 UR	600 UR	1600 UR	560 UR	500 U
1,2-Dichlorobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2-Methylphenol	1800	910	680 J	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
bis(2-chloroisopropyl)ether	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Methylphenol	8200	2700	2000	410 U	420 U	570 J	4900 UJ	2000	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
N-Nitroso-Di-n-propylamine	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Hexachloroethane	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Nitrobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Isophorone	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2-Nitrophenol	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4-Dimethylphenol	16000	3000	1800	410 U	420 U	580 J	4900 UJ	1100	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzoic acid	3800 U	3700 U	1400 J	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
bis(2-Chloroethoxy)methane	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4-Dichlorophenol	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
1,2,4-Trichlorobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Naphthalene	340 J	400 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Chloroaniline	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Hexachlorobutadiene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Chloro-3-methylphenol	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2-Methylnaphthalene	420 J	280 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Hexachlorocyclopentadiene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4,6-Trichlorophenol	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4,5-Trichlorophenol	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
2-Chloronaphthalene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2-Nitroaniline	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
Dimethylphthalate	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Acenaphthylene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,6-Dinitrotoluene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U

TABLE B-1

NORTH AREA
SEMIVOLATILE LABORATORY RESULTS
(Continued)

EPA Sample No.	17B	18B	19B	20B	21B	22B	30A	40B	50A	51A	52A	53A	54A	55A	56A	57A	60ABC	CES-35
Sample Location	CES-2	CES-11	CES-11	CES-1	CES-20	CES-10	Rinseate	Borrow	CES-26	CES-23	CES-24	CES-25	CES-27	CES-21	CES-22	CES-27	Rinseate	CES-35
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/31/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	2/14/91
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)
Analyte:																		
Phenol	2600	480	260 J	2100	720	220 J	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	310 J
bis(2-Chloroethyl)Ether	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2-Chlorophenol	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
1,3-Dichlorobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
1,4-Dichlorobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Benzyl alcohol	440 UR	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
1,2-Dichlorobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2-Methylphenol	190 J	420 U	410 U	270 J	450	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
bis(2-chloroisopropyl)ether	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Methylphenol	550	100 J	100 J	410 J	640	120 T	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
N-Nitroso-Di-n-propylamine	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Hexachloroethane	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Nitrobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Isophorone	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2-Nitrophenol	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4-Dimethylphenol	470	94 J	410 U	730 J	850	170 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Benzoic acid	440 U	2100 U	410 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
bis(2-Chloroethoxy)methane	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4-Dichlorophenol	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
1,2,4-Trichlorobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Naphthalene	440 U	420 U	410 U	240 J	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Chloroaniline	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Hexachlorobutadiene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Chloro-3-methylphenol	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2-Methylnaphthalene	440 U	420 U	410 U	270 J	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Hexachlorocyclopentadiene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4,6-Trichlorophenol	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4,5-Trichlorophenol	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
2-Chloronaphthalene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2-Nitroaniline	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
Dimethylphthalate	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Acenaphthylene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,6-Dinitrotoluene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ

TABLE B-1

NORTH AREA
SEMIVOLATILE LABORATORY RESULTS
(Continued)

EPA Sample No.	01B	02B	03B	04A/B	05B	06B	07B	08B	09B	10B	11B	12B	13B	14B	15B	16B
Sample Location	CES-19	CES-9	CES-18	CES-8	CES-17	CES-7	CES-12	CES-6	CES-16	CES-5	CES-5	CES-15	CES-4	CES-14	CES-3	CES-13
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
3-Nitroaniline	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
Acenaphthene	280 J	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4-Dinitrophenol	760 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
4-Nitrophenol	760 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
Dibenzofuran	360 J	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
2,4-Dinitrotoluene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Diethylphthalate	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Chlorophenyl-phenylether	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Fluorene	210 J	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Nitroaniline	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
4,6-Dinitro-2-methylphenol	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
N-Nitrosodiphenylamine	760 U	1200	250 J	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
4-Bromophenyl-phenylether	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Hexachlorobenzene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Pentachlorophenol	3800 U	3700 U	4000 U	2100 U	2100 U	4400 U	25000 UJ	4900 U	20000 UJ	13000 UJ	13000 UJ	13000 UJ	3000 U	7900 UJ	2800 U	2500 U
Phenanthrene	390 J	730 U	810 U	410 U	420 U	170 J	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Anthracene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Di-n-butylphthalate	760 U	170 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Fluoranthene	680 J	270 J	810 U	410 U	420 U	260 J	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	250 J	1600 UJ	560 U	500 U
Pyrene	590 JN	250 J	810 U	410 U	420 U	160 J	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	270 J	1600 UJ	110 J	500 U
Butylbenzylphthalate	210 J	160 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
3,3'-Dichlorobenzidine	1500 U	1500 U	1600 U	830 U	840 U	1700 U	9900 UJ	2000 U	8200 UJ	5200 UJ	5000 UJ	5300 UJ	1200 U	3200 UJ	1100 U	990 U
Benzo(a)anthracene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	220 JN	1600 UJ	560 U	500 U
Chrysene	760 U	330 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	240 J	1600 UJ	560 U	500 U
bis(2-Ethylhexyl)phthalate	6400	1200	910	410 U	420 U	310 J	4900 UJ	530 J	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Di-n-octylphthalate	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzo(b)fluoranthene	760 U	150 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzo(k)fluoranthene	760 U	280 J	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzo(a)pyrene	160 JN	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Indeno(1,2,3-od)pyrene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Dibenz(a,h)anthracene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U
Benzo(g,h,i)perylene	760 U	730 U	810 U	410 U	420 U	870 U	4900 UJ	980 U	4100 UJ	2600 UJ	2500 UJ	2700 UJ	600 U	1600 UJ	560 U	500 U

TABLE B-1

NORTH AREA
SEMIVOLATILE LABORATORY RESULTS
(Continued)

EPA Sample No.	17B	18B	19B	20B	21B	22B	30A	40B	50A	51A	52A	53A	54A	55A	56A	57A	60ABC	CES-35
Sample Location	CES-2	CES-11	CES-11	CES-1	CES-20	CES-10	Rinseate	Borrow	CES-26	CES-23	CES-24	CES-25	CES-27	CES-21	CES-22	CES-27	Rinseate	CES-35
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/31/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	2/14/91
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)
3-Nitroaniline	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
Acenaphthene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4-Dinitrophenol	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
4-Nitrophenol	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	3900 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 UR	2100 UJ
Dibenzofuran	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
2,4-Dinitrotoluene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 UR	420 UJ
Diethylphthalate	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Chlorophenyl-phenylether	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Fluorene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Nitroaniline	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
4,6-Dinitro-2-methylphenol	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 U	2100 UJ
N-Nitrosodiphenylamine	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
4-Bromophenyl-phenylether	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Hexachlorobenzene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Pentachlorophenol	2200 U	2100 U	2100 U	4100 U	1900 U	2000 U	50 U	1900 U	6200 U	33000 UR	20000 UJ	22000 UJ	2500 U	4200 U	2100 U	2100 U	50 UR	2100 UJ
Phenanthrene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	65 J
Anthracene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Di-n-butylphthalate	230 J	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	45 J
Fluoranthene	120 J	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	100 J
Pyrene	93 JN	420 U	410 UJ	810 UJ	380 UJ	400 UJ	10 UJ	370 UJ	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Butylbenzylphthalate	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
3,3'-Dichlorobenzidine	890 U	830 U	830 U	1640 U	760 U	800 U	20 U	750 UJ	2400 U	13000 UR	7800 UJ	8900 UJ	970 U	1700 U	830 U	850 U	20 U	850 UJ
Benzo(a)anthracene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Chrysene	150 J	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
bis(2-Ethylhexyl)phthalate	600	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 R
Di-n-octylphthalate	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Benzo(b)fluoranthene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	35 J
Benzo(k)fluoranthene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Benzo(a)pyrene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	50 J
Indeno(1,2,3-od)pyrene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Dibenz(a,h)anthracene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ
Benzo(g,h,i)perylene	440 U	420 U	410 U	810 U	380 U	400 U	10 U	370 U	1200 U	6700 UR	3900 UJ	4400 UJ	480 U	840 U	420 U	430 U	10 U	420 UJ

Notes:
1. U = Not detected.
2. J = Estimated quantity.
3. R = Unusable.
4. N = Presumptive evidence of presence.

TABLE B-2

NORTH AREA
PESTICIDES/PCB LABORATORY RESULTS

EPA Sample No.	01A	02A	03A	04A	05A	06A	07A	08A	09A	10A	11A	12A	13A	14A	15A	16A
Sample Location	CES-19	CES-9	CES-18	CES-8	CES-17	CES-7	CES-12	CES-6	CES-16	CES-5	CES-5	CES-15	CES-4	CES-14	CES-3	CES-13
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
alpha-BHC	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
beta-BHC	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
delta-BHC	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Lindane	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Heptachlor	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Aldrin	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Heptachlor epoxide	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Endosulfan I	18 U	18 U	22 U	9.9 U	10 U	11 UJ	67 UJ	12 U	50 UJ	31 UJ	30 UJ	32 UJ	14 U	19 UJ	14 U	12 U
Dieldrin	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
4,4'-DDE	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
Endrin	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
Endosulfan II	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
4,4'-DDD	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
Endosulfan sulfate	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
4,4'-DDT	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
Methoxychlor	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Endrin ketone	36 U	35 U	44 U	20 U	20 U	21 UJ	130 UJ	24 U	100 UJ	62 UJ	59 UJ	64 UJ	29 U	38 UJ	27 U	24 U
alpha-Chlordane	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
gamma-Chlordane	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Toxaphene	360 U	350 U	440 U	200 U	200 U	210 UJ	1300 UJ	240 U	1000 UJ	620 UJ	590 UJ	640 UJ	290 U	380 UJ	270 U	240 U
Aroclor-1016	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Aroclor-1221	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Aroclor-1232	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Aroclor-1242	180 U	180 U	220 U	99 U	100 U	110 UJ	670 UJ	120 U	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Aroclor-1248	1800	2000	2500	99 U	100 U	320 J	1900 J	1500	500 UJ	310 UJ	300 UJ	320 UJ	140 U	190 UJ	140 U	120 U
Aroclor-1254	360 U	350 U	440 U	200 U	200 U	210 UJ	1300 UJ	240 U	1000 UJ	620 UJ	590 UJ	640 UJ	290 U	380 UJ	270 U	240 U
Aroclor-1260	360 U	350 U	440 U	200 U	200 U	210 UJ	1300 UJ	240 U	1000 UJ	620 UJ	590 UJ	640 UJ	290 U	380 UJ	270 U	240 U

Notes:
1. U = Not detected.
2. J = Estimated quantity.
3. R = Unusable.

TABLE B-2

NORTH AREA
PESTICIDES/PCB LABORATORY RESULTS
(Continued)

EPA Sample No.	17A	18A	19A	20A	21A	22A	30A	40A	50B	51B	52B	53B	54B	55B	56B	57B	60ABC	
Sample Location	CES-2	CES-11	CES-11	CES-1	CES-20	CES-10	Rinseate	Borrow	CES-26	CES-23	CES-24	CES-25	CES-27	CES-21	CES-22	CES-27	Rinseate	CES-35
Date Sampled	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/30/90	5/31/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	7/23/90	2/14/91
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Water	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Water	SOIL
Concentration Units	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/L)	(ug/Kg)
alpha-BHC	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
beta-BHC	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
delta-BHC	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
Lindane	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	-
Heptachlor	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
Aldrin	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
Heptachlor epoxide	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
Endosulfan I	11 U	10 U	9.9 U	20 UJ	9.2 U	9.6 U	0.050 U	9.0 U	26 U	80 UR	47 UJ	53 UJ	11 U	10 U	9.9 U	10 U	0.050 U	10 U
Dieldrin	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
4,4'-DDE	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	18 J
Endrin	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
Endosulfan II	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
4,4'-DDD	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
Endosulfan sulfate	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
4,4'-DDT	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	46
Methoxychlor	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Endrin ketone	21 U	20 U	20 U	39 UJ	18 U	19 U	0.10 U	18 U	52 U	160 UR	94 UJ	110 UJ	21 U	20 U	20 U	21 U	0.10 U	21 U
alpha-Chlordane	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
gamma-Chlordane	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Toxaphene	210 U	200 U	200 U	390 UJ	180 U	190 U	1.0 U	180 U	520 U	1600 UR	940 UJ	1100 UJ	210 U	200 U	200 U	210 U	1.0 U	210 U
Aroclor-1016	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Aroclor-1221	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Aroclor-1232	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Aroclor-1242	110 U	100 U	99 U	200 UJ	92 U	96 U	0.50 U	90 U	4300	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Aroclor-1248	190	100 U	99 U	200 UJ	92 U	2400	0.50 U	90 U	260 U	800 UR	470 UJ	530 UJ	110 U	100 U	99 U	100 U	0.50 U	100 U
Aroclor-1254	210 U	200 U	200 U	390 UJ	180 U	190 U	1.0 U	180 U	520 U	1600 UR	940 UJ	1100 UJ	210 U	200 U	200 U	210 U	1.0 U	210 U
Aroclor-1260	210 U	200 U	200 U	390 UJ	180 U	190 U	1.0 U	180 U	520 U	1600 UR	940 UJ	1100 UJ	210 U	200 U	200 U	210 U	1.0 U	210 U

DATA VALIDATION

The data validation reports for chemical analyses performed on the soil/sediment and borrow soil samples are provided in the following section.

QUANTALEX
INCORPORATED

12600 West Colfax Avenue
Suite A-300
Lakewood, Colorado 80215

TEL 303 237·7879
FAX 303 234·5858

September 17, 1990

Mr. Tom Kreutz
Canonie Engineering
94 Inverness Terrace East
Suite 100
Englewood, CO 80112

Dear Mr. Kreutz:

Enclosed are the data validation reports for the following Sample Delivery Group numbers from PAS Clothier:

CLP Pesticide/PCBs	CLP Semi-volatiles
PAS 01A	PAS 01B
PAS 019A	PAS 019B
PAS 050A	PAS 050B

The data has been reviewed and validated. The results from all sample delivery groups have been found as acceptable for use in your operations.

We appreciate the opportunity to provide our services to you.

Please call if you have any questions.

Sincerely Yours,
QuantaLex, Inc.

Anthony W. Toth

Anthony W. Toth
Staff Consultant

cc: File Copy

9-17a/letters

SOP NO. HW-6
Revision #6

CLP [illegible] DATA REVIEW
AND PRELIMINARY REVIEW

URRED BY: _____ Date: 4/6/89
Louis Bevilacqua
Monitoring Management Branch

OVED BY: _____ Date: 4/14/89
Gerard F. McKenna, Chief
Monitoring Management Branch

INTRODUCTION TO DATA VALIDATION

) Scope

..1 This procedure is applicable to organic data obtained from contractor laboratories working for the Contract Laboratory Program (CLP).

..2 The data validation is based upon analytical and quality assurance requirements specified in the Statement of Work (SOW).

) Responsibilities

)ata reviewers will complete the following tasks as assigned by the Data Review Coordinator:

:.1 Data Assessment - The reviewer must answer every question on the checklist. All response shall be in ink.

:.2 Data Assessment Narrative (Attachment 1) - Data reviewer is required to use these forms and must match the action in the narrative with the action taken on the Form I(s).

:.3 Rejection Summary Form (Attachment 2) - Fill in the total number of analytes measured by different analyses and the number of analytes rejected or flagged as estimated due to corresponding quality control criteria. Place an "X" in the boxes where analyses were not performed or criteria do not apply.

2.4 Organic Regional Data Assessment - Data reviewer is also required to fill out Organic Regional Data Assessment Form (Attachment 3).

2.5 Telephone Record Log - The data reviewer should enter the bare facts of inquiry before initiating any authorized telephone conversation with a CLP laboratory. After the case review has been completed, mail the white copy of the Telephone Record Log to the laboratory and the pink copy to SMO. File the yellow copy in the Telephone Record Log folder and attach a photocopy of the Telephone Record Log to the completed Data Assessment Narrative.

2.6 Forwarded Paperwork - Upon completion of the review, the following are to be forwarded to the Regional Sample Control Center (RSCC) located in the Surveillance and Monitoring Branch:

a. data package
b. completed assessment checklist
c. SMO Contract Compliance Screening (CCS)

Forward four (4) copies of the completed Data Assessment Narrative along with four (4) copies of the Organic Data Assessment Form: one each for the appropriate Regional DPO, the Sample Management Office (SMO), and to the last two addresses of the Data Reviewers Mailing List.

2.7 Filed Paperwork - Upon completion of the review, the following are to be filed within the Monitoring and Management Branch (MMB) files:

a. Telephone record Log (copy)
b. Record of Communication (original)
c. Rejection Summary Form

Rejection of Data - All values determined to be unacceptable on the Organic Analysis Data Sheet (Form I) must be flagged with an "R". As soon as review criteria causes data to be rejected, that data can be eliminated from any further review or consideration.

Acceptance Criteria - In order that the reviews be consistent among reviewers, this Standard Operating Procedure (SOP) should be used. Additional guidance can be found in the Functional Guidelines.

SMO Contract Compliance Screening (CCS) - This is intended to aid the reviewer in locating any problems, both corrected and uncorrected. However, the validation should be carried out even if CCS is not present. Resubmittals received from the laboratory in response to CCS must be used by the reviewer.

AGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: SDG# 1A/B

LAB: Canonie Environmental

SITE: _____

Data Completeness and Deliverables	YES	NO	N/A
1.1 Have any missing deliverables been received and added to the data package.	[X]	___	___
ACTION: Call lab for explanation / resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the package under the "Contract Problems/Non-compliance" section of reviewer narrative.			
1.2 Was SMO CCS checklist included with package?	[___]	X	___
Cover Letter/Case Narrative			
2.1 Is the Narrative or Cover Letter present?	[X]	___	___
2.2 Are Case Number and/or SAS number contained in the Narrative or Cover Letter?	[___]	X	___
Data Validation Checklist			
The following checklist is divided into three parts. Part A is filled out if the data package contains any VOA analyses, Part B for any BNA analyses and Part C for Pesticide/PCBs.			
Does this package contain:			
VOA data?	___	X	
BNA data?	X	___	
Pesticide/PCB data?	X	___	
ACTION: Complete corresponding parts of checklist.			

	YES	NO	N/A

PART B: BNA ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [X] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [X] ___

ACTION: Use professional judgement to evaluate the effect on the quality of the data.

ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.

2.0 Holding Times

2.1 Have any BNA holding times, determined from date of collection to date of extraction, been exceeded? ___ [X] ___

Samples for BNA analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.

Table of Holding Time Violations

			(See Traffic Report)		
Sample	Sample Matrix	Date Sampled	Date Lab Received	Date Extracted	Date Analyzed
None					

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

	YES	NO	N/A
If analyses were done more than 14 days beyond holding time, either on the first analysis or upon reanalysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. The reviewer may determine that non-detect data are unusable ("R").			
3.0 Surrogate Recovery (Form II)			
3.1 Are the BNA Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[___]	___	X
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the BNA samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[___]	___	X
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.			
3.3 Were outliers marked correctly with an asterisk?	[X]	___	___
ACTION: Circle all outliers in red.			
3.4 Were two or more base-neutral OR acid surrogate recoveries out of specification for any sample or method blank?	___	[X]	___
If yes, were samples reanalyzed?	[___]	___	X
Were method blanks reanalyzed?	[___]	___	X
ACTION: If all BNA surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet SOW specifications, for the affected fraction only (i.e. base-neutral OR acid compounds):			
1. Flag all positive results as estimated ("J").			
2. Flag all non-detects as estimated detection limits ("UJ").			

	YES	NO	N/A
If any base-neutral or acid surrogate has a recovery of <10% : 1. Flag all positive results for that fraction (i.e. all acid or base-neutral compounds) "J". 2. Flag all non-detects for that fraction "R". Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and re-analyses. Check the internal standard areas.			
3.5 Are there any transcription/calculation errors between raw data and Form II?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
4.0 Matrix Spikes (Form III)			
4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present?	[X]	___	___
4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:			
a. Low Water	[___]	___	X
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.			

4.3 How many BNA spike recoveries are outside QC limits?

Water	Soils
N/A out of 22	4 out of 22

4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Soils
N/A out of 11	0 out of 11

ACTION: If MS and MSD both have less than 10% recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples

	YES	NO	N/A
5.0 Blanks (Form IV)			
5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of BNA TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for BNAs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive BNA results (TCL and/or TIC)?	___	[___]	X

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

YES NO N/A

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

	Sample conc > CRQL but < 10x blank	Sample conc < CRQL & is < 10x blank value	Sample conc > CRQL value & >10x blank value
Common Phthalate Esters	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

	Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL value & > 5 blank value
Other Contaminants	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" (unusable).

6.3 Are there field/rinse/equipment blanks associated with every sample? [___] X ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 GC/MS Tuning and Mass Calibration (Form V)

7.1 Are the GC/MS Tuning and Mass Calibration Forms (Form V) present for Decafluorotriphenylphosphine (DFTPP)? [X] ___ ___

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? [X] ___ ___

7.3 Has a tuning performance compound been analyzed for every twelve hours of sample analysis per instrument? [X] ___ ___

ACTION: If any tuning data are missing, take action specified in 3.2 above.

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

	YES	NO	N/A

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundance criteria been met for each instrument used? [X] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If tuning calibration is in error, flag all associated sample data as unusable ("R"). However, if expanded ion criteria are met (See 1988 Functional Guidelines), the data reviewer may accept data with appropriate qualifiers.

7.5 Are there any transcription / calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.) ___ [X] ___

7.6 Have the appropriate number of significant figures (two) been reported? (Check at least two values, but if errors are found check more values.) X [___] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make necessary corrections and note errors under "Conclusions".

7.7 Are the spectra of the mass calibration compound acceptable? [X] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

8.0 Target Compound List (TCL) Analytes

8.1 Are the Organic Analysis Data Sheets (Form I BNA) present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [X] ___ ___

b. Matrix spikes and matrix spike duplicates [X] ___ ___

c. Blanks [X] ___ ___

	YES	NO	N/A
8.2 Are the BNA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[X]	___	___
c. Blanks	[X]	___	___
ACTION: If any data are missing, take action specified in 3.2 above.			
8.3 Are the response factors shown in the Quant Report?	[___]	X	___
8.4 Is chromatographic performance acceptable with respect to:			
Baseline stability	[X]	___	___
Resolution	[X]	___	___
Peak shape	[X]	___	___
Full-scale graph (attenuation)	[X]	___	___
Other:_____	[___]	___	X
ACTION: Use professional judgement to determine the acceptability of the data.			
8.5 Are the lab-generated standard mass spectra of the identified BNA compounds present for each sample?	[___]	X	___
ACTION: If any mass spectra are missing, take action specified in 3.2 above. If Lab does not generate their own standard spectra, make note in "Contract Problems/Non-compliance".			
8.6 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[X]	___	___
8.7 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
8.8 Do sample and standard relative ion intensities agree within 20%?	[___]	X	___
ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected, flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected (at the calculated detection limit).			

	YES	NO	N/A
9.0 Tentatively Identified Compounds (TIC)			
9.1 Are all Tentatively Identified Compound Forms (Form I, Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "J" qualifier?	[X]	___	___
9.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
a. Samples and/or fractions as appropriate	[___]	___	X
b. Blanks	[X]	___	___
ACTION: If any TIC data are missing, take action specified in 3.2 above.			
ACTION: Add "J" qualifier if missing and "N" qualifier to all identified TIC compounds on Form I, Part B.			
9.3 Are any TCL compounds (from any fraction) listed as TIC compounds (example: 1,2-dimethylbenzene is xylene--a VOA TCL--and should not be reported as a TIC)?	X	[___]	___
ACTION: Flag with "R" any TCL compound listed as a TIC.			
9.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
9.5 Do TIC and "best match" standard relative ion intensities agree within 20%?	[X]	___	___
ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate.			
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	[X]	___
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	___	[X]	___

	YES	NO	N/A

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration? [X] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete for the BNA fraction? [X] ___ ___

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

12.2 Are response factors stable for BNAs over the concentration range of the calibration (RSD <30%)? [___] X ___

ACTION: Circle all outliers in red.

ACTION: When RSD >30%, non-detects may be qualified using professional judgement. Flag all positive results "J". When RSD >90%, flag all non-detects as unusable ("R"). (Region II policy.)

12.3 Do any compounds have a RRF < 0.05? ___ [X] ___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has an average RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

	YES	NO	N/A
12.4 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or %RSD? (Check at least two values but if errors are found, check more.)	___	[X]	___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

13.0 GC/MS Continuing Calibration (Form VII)

13.1 Are the Continuing Calibration Forms (Form VII) present and complete for the BNA fraction?	[___]	X	___
13.2 Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	[X]	___	___

ACTION: List below all sample analyses that were not within twelve hours of the previous continuing calibration analysis.

_____

_____

_____

ACTION: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, call lab for explanation / resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

13.3 Do any continuing calibration standard compounds have a RRF < 0.05?	___	[X]	___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has a RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

13.4 Do any compounds have a % difference between initial and continuing calibration RRF > 25%?	X	[___]	___

ACTION: Circle all outliers in red and qualify associated sample data as outlined in the table below:

YES NO N/A

% DIFFERENCE

25-50	50-90	>90
'J' positive results, no action for non detects	'J' positive results, 'UJ' non detects	'J' positive results, "R" non detects

13.5 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more.) ___ [X] ___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

14.0 Internal Standards (Form VIII)

14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits for each continuing calibration? [X] ___ ___

ACTION: List all the outliers below.

Sample #	Internal Std	Area	Lower Limit	Upper Limit
_____	_____	_____	_____	None
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

(Attach additional sheets if necessary.)

ACTION: If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard. If extremely low area counts are reported, or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable ("R").

14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard? [X] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

	YES	NO	N/A
15.0 Field Duplicates			
15.1 Were any field duplicates submitted for BNA analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

	YES	NO	N/A
PART C: PESTICIDE/PCB ANALYSES			
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are the Traffic Report Forms present for all samples?	[X]	___	___
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?	___	[X]	___
ACTION: Use professional judgement to evaluate the effect on the quality of the data.			
ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.			
2.0 Holding Times			
2.1 Have any PEST/PCB holding times, determined from date of collection to date of extraction, been exceeded?	___	[X]	___
Samples for PEST/PCB analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.			
3.0 Surrogate Recovery (Form II)			
3.1 Are the PEST/PCB Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[___]	___	X
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the PEST/PCB samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[___]	___	X
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

	YES	NO	N/A

ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.

3.3 Were outliers marked correctly with an asterisk? [___] ___ X

ACTION: Circle all outliers in red.

3.4 Was surrogate (DBC) recovery outside of the contract specification for any sample or blank? ___ [X] ___

ACTION: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J" and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewers professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

3.5 Are there any transcription/calculation errors between raw data and Form II? ___ [X] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present? [X] ___ ___

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [___] ___ X

b. Med Water [___] ___ X

c. Low Soil [X] ___ ___

d. Med Soil [___] ___ X

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.

4.3 How many PEST/PCB spike recoveries are outside QC limits?

Water	Soils
N/A out of 12	0 out of 12

	YES	NO	N/A
4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			

Water	Soils
N/A out of 6	0 out of 6

ACTION: If MS and MSD both have less than zero recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples.

5.0 Blanks (Form IV)

	YES	NO	N/A
5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of Pesticide TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.			
Is the chromatographic performance (baseline stability) for each instrument acceptable for PEST/PCBs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

	YES	NO	N/A
6.1 Do any method/instrument/reagent blanks have positive results for PEST/PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive PEST/PCB results?	___	[___]	X

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

	YES	NO	N/A

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL & > 5x blank value
Flag sample result with a "U"; cross out "B" flag	Reject sample result and report CRQL; cross out "B" flag	No qualification is needed

6.3 Are there field/rinse/equipment blanks associated with every sample? [ ] X

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 Calibration and GC Performance

7.1 Are the following Gas Chromatograms and Data System Printouts for both Primary and Confirmation (confirmation standards not required if there are no positive results above CRQL) column present:

a. Evaluation Standard Mix A [X]

b. Evaluation Standard Mix B [X]

c. Evaluation Standard Mix C [X]

d. Individual Standard Mix A [X]

e. Individual Standard Mix B [X]

f. Multi-component Pesticides Toxaphene & Chlordane [X]

g. Aroclors 1016/1260 [X]

h. Aroclors 1221, 1232, 1242, 1248, and 1254 [X]

ACTION: If no, take action specified in 3.2 above

	YES	NO	N/A
7.2 Is Form VIII Pest-1 present and complete for each GC column (primary and confirmation) and each 72 hour sequence of analyses?	[X]	___	___

ACTION: If no, take action specified in 3.2 above.

7.3 Are there any transcription/calculation errors between raw data and Form VIII?	___	[X]	___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

7.4 Has the total breakdown on quantitation or confirmation column exceeded 20% for DDT?	___	[X]	___
- for Endrin?	___	[X]	___
or if Endrin aldehyde and 4,4'-DDD co-elute and there is a peak at their retention time, has the combined DDT and Endrin breakdown exceeded 20%?	___	[___]	X

ACTION:

a. If DDT breakdown is greater than 20% on quantitation column beginning with the samples following the last in control standard:

   1. Flag all positive DDT results "J".
   2. If DDT was not detected but DDD and/or DDE are positive, flag the DDT non-detect "R".
   3. Flag positive DDD and DDE results "JN".
   4. If DDT breakdown is > 20% on confirmation column and DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether DDT should be reported on Form I (if reported, flag result "N").

b. If Endrin breakdown is > 20% on quantitation column, beginning with the samples following the last in control standard:

   1. Flag all positive Endrin results "J".
   2. If Endrin was not detected, but Endrin Aldehyde and/or Endrin Ketone are positive, flag the Endrin non-detect "R".
   3. Flag Endrin Ketone positive results "JN".
   4. If Endrin breakdown is > 20% on confirmation column and Endrin is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin should be reported on Form I (if reported, flag result "N").

c. If the combined breakdown is used (it can only be used if the conditions in 7.4 above are met) and is > 20% on quantitation column beginning with the last in control standard, take the actions specified in 7.4 a and b above. If the combined breakdown is >20% on confirmation column and Endrin or DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin or DDT should be reported on Form I (if reported, flag result "N").

	YES	NO	N/A
7.5 Is the linearity check RSD of all four calibration factors <10% for the quantitation column?	[X]	___	___
ACTION: If no, flag positive hits for all pesticide and PCB analytes "J" for all associated samples. Do not flag toxaphene or DDT if they are quantified from a 3-point calibration curve.			
7.6 Is the % difference between the EVAL A and each analysis (quantitation and confirmation) DBC retention time within QC limits (2% for packed column, 0.3% for capillary [I.D. < 0.32 mm], 1% for megabore [0.32 < I.D. < 2 mm]) ?	[X]	___	___
ACTION: DBC retention time cannot be evaluated if DBC is not detected. If it is present and has a retention time out of QC limits, then use professional judgement to determine the reliability of the analysis and flag results "R", if appropriate.			
7.7 Was the proper analytical sequence followed for each 72 hour period of analyses (page PEST D-36 in 8/87 SOW).	[X]	___	___
ACTION: If no, use professional judgement to determine the severity of the effect on the data and accept or reject it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.			
8.0 Pesticide/PCB Standards Summary			
8.1 Is Form IX present and complete for each GC column and 72 hr sequence of analyses?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
8.2 Are there any transcription/calculation errors between raw data and Form IX?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
8.3 Is DDT retention time for packed columns > 12 min (except OV-1 and OV-101 columns)?	[___]	___	X
ACTION: If no, check that there is adequate resolution between individual components. If not, flag results for compounds that interfere with each other (co-elute) "R".			
8.4 Do all standard retention times fall within the windows established for the first IND A and IND B analyses?	[___]	X	___

	YES	NO	N/A
ACTION: Beginning with the samples following the last in control standard, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times. If no peaks are found and, DBC is visible non-detects are valid. If peaks are present and cannot be identified through "pattern recognition" or a consistent shift in standard retention times, flag all affected compound results "R".			
8.5 Are the continuing calibration standard calibration factors within 15% (for quantitation column) or 20% (for confirmation column) of the initial (at beginning of 72 hr sequence) calibration factors?	[ ]	X	
ACTION: If no, flag all associated positive results "J". Use professional judgement to determine whether or not to flag non-detects.			
9.0 Pesticide/PCB Identification			
9.1 Is Form X complete for every sample in which a pesticide or PCB was detected?	[X]		
ACTION: If no, take action specified in 3.2 above.			
9.2 Are there any transcription errors between raw data and Form X?		[X]	
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
9.3 Are retention times of sample compounds within the calculated retention time windows for both quantitation and confirmation analyses?	[X]		
Was GC/MS confirmation provided when required (when compound concentration is > 10 ug/ml in final extract)?	[ ]		X
ACTION: Reject ("R") all positive results (meeting quantitation column criteria, but missing confirmation by a second column or GC/MS (if appropriate). Also, reject ("R") all positive results not meeting retention time window criteria unless associated standard compounds are similarly biased (i.e. base on RRT to DBC).			
9.4 Check chromatograms for false negatives, especially for the multiple peak components toxaphene and PCB's. Were there any false negatives?		[X]	
ACTION: If appropriate PCB standards were not analyzed, or if the lab performed no confirmation analysis, flag the appropriate data with an "R".			

	YES	NO	N/A
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Were any errors found?	___	[X]	___
NOTE: Simple peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.			
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[___]	___
ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.			
11.0 Chromatogram Quality			
11.1 Were baselines stable?	[X]	___	___
11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?	___	[X]	___
11.3 Were early eluting peaks (for early eluting analytes) resolved to baseline?	[X]	___	___
ACTION: For 11.1 and 11.2, comment only. For 11.3, reject ("R") those analytes that are not sufficiently resolved.			

	YES	NO	N/A
12.0 Field Duplicates			
12.1 Were any field duplicates submitted for PEST/PCB analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

TOTAL REVIEW

CLP DATA ASSESSMENT

Functional Guidelines for Evaluating Organics Analysis

Case No._____ SDG No. 01 A/B Laboratory Canonie Site_____

DATA ASSESSMENT:

The current functional guidelines (1988) for evaluating organic data have been applied.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "U" (non-detects), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). All action is detailed on the attached sheets.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Reviewer's Signature: William T Fee **Date:** 9/17/90

Reviewer's Signature: Jill Haseltine **Date:** 9-17-90

Verified By: Anthony W. Roth **Date:** 9-17-90

DATA ASSESSMENT:

1. **Holding Time:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "UJ", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No action was taken because all holding times were met.

DATA ASSESSMENT

2. **Blank Contamination:**

Quality assurance (QA) blanks, i.e., method, trip field, rinse and water blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) **Method Blank contamination**

No method blank contamination.

B) **Field or rinse blank contamination ("water blanks" or "distilled water blanks" are validated like any other sample)**

A field blank or rinse blank was not collected with these samples.

C) **Trip blank contamination**

A trip blank was not included with these samples.

DATA ASSESSMENT:

3. Mass Spectrometer Tuning:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable, "R".

All criteria were met and no action was taken.

DATA ASSESSMENT:

4. Calibration:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) **Response Factor:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05 in both the initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected ("R").

Semi-volatiles: No problems.

Pesticide/PCB: In the analyses of Individual Mix B of 6/16/90 (0107) on both columns, several compounds fell outside their retention time windows. In addition, in Individual Mix B of 6/15/90 (2215) on the RTX-35 column, Endrin Ketone fell outside its retention time window. The data were not affected and no action was necessary.

DATA ASSESSMENT:

5. Calibration:

A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <30% and %D must be <25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ" (if %D or RSD >50%). If there is a gross deviation of %RSD and %D, the non-detects may be rejected ("R").

For the PCB/Pesticide fraction, %RSD for aldrin, endrin, DDT, and dibutylchlorendate must not exceed 10%. Percent D must be within 15% on the quantitation column and 20% on the confirmation column.

Semi-volatiles: The %Ds for Benzoic Alcohol exceeded 90% in the 6/14/90 and 6/15/90 continuing calibrations. The non-detects for Benzoic Alcohol in samples 11B, 12B, 13B, 14B, 15B, 1B, 3B, 4B, 5B, 6B, and 17B were rejected "R".

The %Ds for Benzo(b)fluoranthene and Benzo(k)fluoranthene exceeded 25% in the 6/12/90 continuing calibration. The positive results for these two compounds in sample 2B were estimated "J".

The calibration had additional compounds whose %RSDs and %Ds exceeded 30% or 25%, respectively. However, no action was required because there were no positive results for these compounds in the associated sample.

Pesticide/PCB: Although there were %Ds which exceeded 15%, the 15 %D criteria was met on at least one column for all calibrations. No action was necessary.

The 20 %D criteria (Form 9) was not met for beta-BHC in the analysis of Individual Mix B on 6/16/90 (0107) on the RTX-5 column. This was the last standard of the sequence. The data were not affected and no action was necessary.

DATA ASSESSMENT:

6. Surrogates:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

Semi-volatiles: The recovery of the surrogate 2,4,6-Tribromophenol exceeded QC limits in sample 17B. No action is required when only one surrogate fails recovery limits in semi-volatile fractions.

Pesticide/PCB: Recoveries of surrogate Dibutylchlorendate (DBC) were below the criteria in samples 06A and 07A. Therefore, all results in these samples were estimated "J".

The surrogate recoveries reported on Form 2 were generated from the confirmation column (RTX-35). Therefore, surrogate recoveries were recalculated using the primary column (RTX-5), handwritten onto Form 2, and used for qualification.

DATA ASSESSMENT:

7. Internal Standards Performance:

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more that +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems.

DATA ASSESSMENT:

8. Compound Identification:

A) Volatile and Semi-volatile fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within +/- 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

B) Pesticide Fraction

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeded 10 ng/ml in the final sample extract.

Semi-volatiles: In several instances, the presence of numerous extraneous ions from co-eluting saturated hydrocarbons made identification of TCL compounds difficult. The results for these compounds were presumed present and estimated "JN". The affected samples and compounds were as follows:

Sample 1B: Pyrene and Benzo(a)pyrene
13B: Benzo(a)anthracene
17B: Pyrene

The VOA compounds 1,1,2,2-Tetrachloroethane in samples 13B and 14B; Ethylbenzene in samples 2B and 17B; and Xylene in samples 2B and 6B were reported as TICs. These TICs were rejected "R" in these samples.

Phenanthrene and Pyrene were detected in sample 6B at low levels but were not reported on Form 1 as the results were marked out by the analyst. However mass spectra was provided which confirmed the identity of these two compounds. Thus, the positive results for these compounds were added to Form 1A for sample 6B and estimated "J".

Mass spectra was not provided to confirm the positive result for Phenol in sample 9B. Since the relative retention time (RRT) met criteria and the value was already estimated "J" due to being below the CRQL, no action was taken.

Mass spectra was not provided to verify the positive result for 2,4-Dimethylphenol in the dilution of sample 1B. However, because 2,4-Dimethylphenol's identity was confirmed in the original analysis, no action was necessary.

DATA ASSESSMENT:

8. Compound Identification:

A) Volatile and Semi-volatile fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within +/- 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

B) Pesticide Fraction

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeded 10 ng/ml in the final sample extract.

Semi-volatiles: (continued from previous page)
All TICs were estimated "J" as they were not qualified by the laboratory and all identified TICs were qualified with an "N" according to the Functional Guidelines.

Several TICs were reported on the Form 1s for the samples, although their areas were less than 10% of the nearest internal standard.

Pesticide/PCB: No problems.

DATA ASSESSMENT:

9. Matrix Spike/Spike Duplicate, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for some additional qualification of the data.

Semi-volatiles: The compounds 2,4-Dinitrotoluene and Pentachlorophenol exceeded spike recovery limits in the matrix spike and matrix spike duplicate. No action was taken because results are not generally qualified solely on MS/MSD data.

Pesticide/PCB: No problems.

DATA ASSESSMENT:

10. Other QC Data Out of Specification:

Semi-volatiles: All results in samples 7B, 9B, 10B, 11B, 12B, and 14B are estimated "J" because these samples analyzed as soil matrices contained more than 50% moisture.

Pesticide/PCB: All results in samples 07A, 09A, 10A, 11A, 12A, and 14A are estimated "J" because the samples, which were analyzed as soils, contained greater than 50% moisture.

11. System Performance and Overall Assessment (continued on next page if necessary):

Semi-volatiles: Form 1 for the method blank indicated that GPC clean-up was used; however, the CRQLs were not adjusted to account for GPC clean-up. The extraction log indicated that the samples and method blank were extracted on 6/4/90, however, Form 1s and the case narrative indicated that extraction was performed on 6/6/90.

The 20 ppb standard used for the 6/4/90 initial calibration on instrument MS04 was analyzed more than 12 hours after the other four standards. The 20 ppb standard that was listed on Form 5 (pg. 21) was not used. Although this is not standard practice, no action was taken.

12. Contract Problems----Non-Compliance

Semi-volatiles: The first page of Form 7 for the 6/15/90 continuing calibration was not submitted. The missing Form was submitted upon request for resubmittal.

13. This package contains re-extraction, re-analysis or dilution. Upon reviewing the QA results, the following form I(s) are identified to be used.

Semi-volatiles: The Form 1 from the original analysis of sample 1B was used. The Form 1 from the dilution was marked out with an "X". The positive results for Phenol and 2,4-Dimethylphenol from the dilution were added to Form 1 of the original analysis.

DATA ASSESSMENT:

11. System Performance and Overall Assessment (continued):

Pesticide/PCB: On the Organics Extractions Report, the final volume of each soil extract was listed as 10 milliliters. After review with the laboratory, this volume was actually determined to be 1 milliliter.

SOP NO. HW-6
Revision #6

CLP ORGANICS DATA REVIEW AND PRELIMINARY REVIEW

URRED BY: _____ Date: 4/6/89
Louis Bavilacqua
Monitoring Management Branch

OVED BY: _____ Date: 4/14/89
Gerard F. McKenna, Chief
Monitoring Management Branch

INTRODUCTION TO DATA VALIDATION

Scope

1.1 This procedure is applicable to organic data obtained from contractor laboratories working for the Contract Laboratory Program (CLP).

1.2 The data validation is based upon analytical and quality assurance requirements specified in the Statement of Work (SOW).

Responsibilities

Data reviewers will complete the following tasks as assigned by the Data Review Coordinator:

2.1 Data Assessment - The reviewer must answer every question on the checklist. All response shall be in ink.

2.2 Data Assessment Narrative (Attachment 1) - Data reviewer is required to use these forms and must match the action in the narrative with the action taken on the Form I(s).

2.3 Rejection Summary Form (Attachment 2) - Fill in the total number of analytes measured by different analyses and the number of analytes rejected or flagged as estimated due to corresponding quality control criteria. Place an "X" in the boxes where analyses were not performed or criteria do not apply.

2.4 Organic Regional Data Assessment - Data reviewer is also required to fill out Organic Regional Data Assessment Form (Attachment 3).

2.5 Telephone Record Log - The data reviewer should enter the bare facts of inquiry before initiating any authorized telephone conversation with a CLP laboratory. After the case review has been completed, mail the white copy of the Telephone Record Log to the laboratory and the pink copy to SMO. File the yellow copy in the Telephone Record Log folder and attach a photocopy of the Telephone Record Log to the completed Data Assessment Narrative.

2.6 Forwarded Paperwork - Upon completion of the review, the following are to be forwarded to the Regional Sample Control Center (RSCC) located in the Surveillance and Monitoring Branch:

a. data package
b. completed assessment checklist
c. SMO Contract Compliance Screening (CCS)

Forward four (4) copies of the completed Data Assessment Narrative along with four (4) copies of the Organic Data Assessment Form: one each for the appropriate Regional DPO, the Sample Management Office (SMO), and to the last two addresses of the Data Reviewers Mailing List.

2.7 Filed Paperwork - Upon completion of the review, the following are to be filed within the Monitoring and Management Branch (MMB) files:

a. Telephone record Log (copy)
b. Record of Communication (original)
c. Rejection Summary Form

Rejection of Data - All values determined to be unacceptable on the Organic Analysis Data Sheet (Form I) must be flagged with an "R". As soon as review criteria causes data to be rejected, that data can be eliminated from any further review or consideration.

Acceptance Criteria - In order that the reviews be consistent among reviewers, this Standard Operating Procedure (SOP) should be used. Additional guidance can be found in the Functional Guidelines.

SMO Contract Compliance Screening (CCS) - This is intended to aid the reviewer in locating any problems, both corrected and uncorrected. However, the validation should be carried out even if CCS is not present. Resubmittals received from the laboratory in response to CCS must be used by the reviewer.

PAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: SDG# 19B/A

LAB: Canonie Environmental

SITE:

Data Completeness and Deliverables	YES	NO	N/A
1.1 Have any missing deliverables been received and added to the data package.	[ ]		X
ACTION: Call lab for explanation / resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the package under the "Contract Problems/Non-compliance" section of reviewer narrative.			
1.2 Was SMO CCS checklist included with package?	[ ]	X	
Cover Letter/Case Narrative			
2.1 Is the Narrative or Cover Letter present?	[X]		
2.2 Are Case Number and/or SAS number contained in the Narrative or Cover Letter?	[ ]	X	
Data Validation Checklist			
The following checklist is divided into three parts. Part A is filled out if the data package contains any VOA analyses, Part B for any BNA analyses and Part C for Pesticide/PCBs.			
Does this package contain:			
VOA data?		X	
BNA data?	X		
Pesticide/PCB data?	X		
ACTION: Complete corresponding parts of checklist.			

	YES	NO	N/A

PART B: BNA ANALYSES

1.0 Traffic Reports and Laboratory Narrative

	YES	NO	N/A
1.1 Are the Traffic Report Forms present for all samples?	[X]	___	___
1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?	___	[X]	___

ACTION: Use professional judgement to evaluate the effect on the quality of the data.

ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.

2.0 Holding Times

	YES	NO	N/A
2.1 Have any BNA holding times, determined from date of collection to date of extraction, been exceeded?	___	[X]	___

Samples for BNA analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.

Table of Holding Time Violations

Sample	Sample Matrix	Date Sampled	(See Traffic Report) Date Lab Received	Date Extracted	Date Analyzed
None					

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

	YES	NO	N/A

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon reanalysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. The reviewer may determine that non-detect data are unusable ("R").

3.0 Surrogate Recovery (Form II)

3.1 Are the BNA Surrogate Recovery Summaries (Form II) present for each of the following matrices:

a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

3.2 Are all the BNA samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:

a. Low Water	[___]	X	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.

3.3 Were outliers marked correctly with an asterisk?	[X]	___	___

ACTION: Circle all outliers in red.

3.4 Were two or more base-neutral OR acid surrogate recoveries out of specification for any sample or method blank?	X	[___]	___
If yes, were samples reanalyzed?	[___]	___	X
Were method blanks reanalyzed?	[X]	___	___

ACTION: If all BNA surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet SOW specifications, for the affected fraction only (i.e. base-neutral OR acid compounds):

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ").

	YES	NO	N/A
If any base-neutral or acid surrogate has a recovery of <10% : 1. Flag all positive results for that fraction (i.e. all acid or base-neutral compounds) "J". 2. Flag all non-detects for that fraction "R". Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and re-analyses. Check the internal standard areas.			
3.5 Are there any transcription/calculation errors between raw data and Form II?	[X]	[ ]	
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
4.0 Matrix Spikes (Form III)			
4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present?	[X]		
4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:			
a. Low Water	[ ]	X	
b. Med Water	[ ]		X
c. Low Soil	[X]		
d. Med Soil	[ ]		X
ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.			

4.3 How many BNA spike recoveries are outside QC limits?

Water	Soils
1 out of 22	2 out of 22

4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Soils
2 out of 11	0 out of 11

ACTION: If MS and MSD both have less than 10% recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples

	YES	NO	N/A
5.0 Blanks (Form IV)			
5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of BNA TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.			
Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for BNAs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	X	[ ]	___
6.2 Do any field/rinse blanks have positive BNA results (TCL and/or TIC)?	X	[ ]	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

YES NO N/A

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

	Sample conc > CRQL but < 10x blank	Sample conc < CRQL & is < 10x blank value	Sample conc > CRQL value & >10x blank value
Common Phthalate Esters	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

	Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL value & > 5 blank value
Other Contaminants	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" (unusable).

6.3 Are there field/rinse/equipment blanks associated with every sample? [___] X ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 GC/MS Tuning and Mass Calibration (Form V)

7.1 Are the GC/MS Tuning and Mass Calibration Forms (Form V) present for Decafluorotriphenylphosphine (DFTPP)? [X] ___ ___

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? [X] ___ ___

7.3 Has a tuning performance compound been analyzed for every twelve hours of sample analysis per instrument? [X] ___ ___

ACTION: If any tuning data are missing, take action specified in 3.2 above.

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

				YES	NO	N/A
DATE	TIME	INSTRUMENT	SAMPLE NUMBERS			

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundance criteria been met for each instrument used? [X] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If tuning calibration is in error, flag all associated sample data as unusable ("R"). However, if expanded ion criteria are met (See 1988 Functional Guidelines), the data reviewer may accept data with appropriate qualifiers.

7.5 Are there any transcription / calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.) ___ [X] ___

7.6 Have the appropriate number of significant figures (two) been reported? (Check at least two values, but if errors are found check more values.) X [___] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make necessary corrections and note errors under "Conclusions".

7.7 Are the spectra of the mass calibration compound acceptable? [X] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

8.0 Target Compound List (TCL) Analytes

8.1 Are the Organic Analysis Data Sheets (Form I BNA) present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [X] ___ ___

b. Matrix spikes and matrix spike duplicates [X] ___ ___

c. Blanks [X] ___ ___

	YES	NO	N/A
8.2 Are the BNA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[___]	X	___
c. Blanks	[X]	___	___
ACTION: If any data are missing, take action specified in 3.2 above.			
8.3 Are the response factors shown in the Quant Report?	[___]	X	___
8.4 Is chromatographic performance acceptable with respect to:			
Baseline stability	[X]	___	___
Resolution	[X]	___	___
Peak shape	[X]	___	___
Full-scale graph (attenuation)	[X]	___	___
Other:_____	[___]	__	X
ACTION: Use professional judgement to determine the acceptability of the data.			
8.5 Are the lab-generated standard mass spectra of the identified BNA compounds present for each sample?	[X]	___	___
ACTION: If any mass spectra are missing, take action specified in 3.2 above. If Lab does not generate their own standard spectra, make note in "Contract Problems/Non-compliance".			
8.6 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[X]	___	___
8.7 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	[___]	X	___
8.8 Do sample and standard relative ion intensities agree within 20%?	[___]	X	___
ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected, flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected (at the calculated detection limit).			

	YES	NO	N/A
9.0 Tentatively Identified Compounds (TIC)			
9.1 Are all Tentatively Identified Compound Forms (Form I, Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "J" qualifier?	[X]	___	___
9.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Blanks	[___]	___	X
ACTION: If any TIC data are missing, take action specified in 3.2 above.			
ACTION: Add "J" qualifier if missing and "N" qualifier to all identified TIC compounds on Form I, Part B.			
9.3 Are any TCL compounds (from any fraction) listed as TIC compounds (example: 1,2-dimethylbenzene is xylene--a VOA TCL--and should not be reported as a TIC)?	X	[___]	___
ACTION: Flag with "R" any TCL compound listed as a TIC.			
9.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
9.5 Do TIC and "best match" standard relative ion intensities agree within 20%?	[X]	___	___
ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate.			
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	X	[___]	___
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	___	[X]	___

	YES	NO	N/A

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration? [X] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete for the BNA fraction? [X] ___ ___

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

12.2 Are response factors stable for BNAs over the concentration range of the calibration (RSD <30%)? [___] X ___

ACTION: Circle all outliers in red.

ACTION: When RSD >30%, non-detects may be qualified using professional judgement. Flag all positive results "J". When RSD >90%, flag all non-detects as unusable ("R"). (Region II policy.)

12.3 Do any compounds have a RRF < 0.05? ___ [X] ___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has an average RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

	YES	NO	N/A
12.4 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or %RSD? (Check at least two values but if errors are found, check more.)	___	[X]	___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

13.0 GC/MS Continuing Calibration (Form VII)

13.1 Are the Continuing Calibration Forms (Form VII) present and complete for the BNA fraction?	[X]	___	___
13.2 Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	[X]	___	___

ACTION: List below all sample analyses that were not within twelve hours of the previous continuing calibration analysis.

None

ACTION: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, call lab for explanation / resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

13.3 Do any continuing calibration standard compounds have a RRF < 0.05?	___	[X]	___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has a RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

13.4 Do any compounds have a % difference between initial and continuing calibration RRF > 25%?	X	[___]	___

ACTION: Circle all outliers in red and qualify associated sample data as outlined in the table below:

YES NO N/A

% DIFFERENCE

25-50	50-90	>90
'J' positive results, no action for non detects	'J' positive results, 'UJ' non detects	'J' positive results, "R" non detects

13.5 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more.) ___ [X] ___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

14.0 Internal Standards (Form VIII)

14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits for each continuing calibration? [___] X ___

ACTION: List all the outliers below.

Sample #	Internal Std	Area	Lower Limit	Upper Limit
19BMSD	IS6 (PRY)	11163	15198	60794
22B	IS5 (CRY)	21685	23391	46782
22B	IS6 (PRY)	10712	15198	60794

(Attach additional sheets if necessary.)

ACTION: If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard. If extremely low area counts are reported, or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable ("R").

14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard? [X] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

	YES	NO	N/A
15.0 Field Duplicates			
15.1 Were any field duplicates submitted for BNA analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

PART C: PESTICIDE/PCB ANALYSES

	YES	NO	N/A
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are the Traffic Report Forms present for all samples?	[X]	___	___
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?	___	[X]	___
ACTION: Use professional judgement to evaluate the effect on the quality of the data.			
ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.			
2.0 Holding Times			
2.1 Have any PEST/PCB holding times, determined from date of collection to date of extraction, been exceeded?	___	[X]	___
Samples for PEST/PCB analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.			
3.0 Surrogate Recovery (Form II)			
3.1 Are the PEST/PCB Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the PEST/PCB samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

	YES	NO	N/A

ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.

3.3 Were outliers marked correctly with an asterisk? [X] ___ ___

ACTION: Circle all outliers in red.

3.4 Was surrogate (DBC) recovery outside of the contract specification for any sample or blank? X [___] ___

ACTION: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J" and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewers professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

3.5 Are there any transcription/calculation errors between raw data and Form II? ___ [X] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present? [X] ___ ___

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [___] X ___

b. Med Water [___] ___ X

c. Low Soil [X] ___ ___

d. Med Soil [___] ___ X

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.

4.3 How many PEST/PCB spike recoveries are outside QC limits?

Water	Soils
0 out of 12	0 out of 12

	YES	NO	N/A
4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			

Water	Soils
1 out of 6	0 out of 6

ACTION: If MS and MSD both have less than zero recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples.

5.0 Blanks (Form IV)

5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of Pesticide TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.			
Is the chromatographic performance (baseline stability) for each instrument acceptable for PEST/PCBs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for PEST/PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive PEST/PCB results?	___	[X]	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

YES NO N/A

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL & > 5x blank value
Flag sample result with a "U"; cross out "B" flag	Reject sample result and report CRQL; cross out "B" flag	No qualification is needed

6.3 Are there field/rinse/equipment blanks associated with every sample? [ ] X

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 Calibration and GC Performance

7.1 Are the following Gas Chromatograms and Data System Printouts for both Primary and Confirmation (confirmation standards not required if there are no positive results above CRQL) column present:

a. Evaluation Standard Mix A [X]
b. Evaluation Standard Mix B [X]
c. Evaluation Standard Mix C [X]
d. Individual Standard Mix A [X]
e. Individual Standard Mix B [X]
f. Multi-component Pesticides Toxaphene & Chlordane [X]
g. Aroclors 1016/1260 [X]
h. Aroclors 1221, 1232, 1242, 1248, and 1254 [X]

ACTION: If no, take action specified in 3.2 above

	YES	NO	N/A
7.2 Is Form VIII Pest-1 present and complete for each GC column (primary and confirmation) and each 72 hour sequence of analyses?	[X]	___	___

ACTION: If no, take action specified in 3.2 above.

7.3 Are there any transcription/calculation errors between raw data and Form VIII?	___	[X]	___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

7.4 Has the total breakdown on quantitation or confirmation column exceeded 20% for DDT?	___	[X]	___
- for Endrin?	___	[X]	___
or if Endrin aldehyde and 4,4'-DDD co-elute and there is a peak at their retention time, has the combined DDT and Endrin breakdown exceeded 20%?	___	[___]	X

ACTION:

a. If DDT breakdown is greater than 20% on quantitation column beginning with the samples following the last in control standard:

1. Flag all positive DDT results "J".
2. If DDT was not detected but DDD and/or DDE are positive, flag the DDT non-detect "R".
3. Flag positive DDD and DDE results "JN".
4. If DDT breakdown is > 20% on confirmation column and DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether DDT should be reported on Form I (if reported, flag result "N").

b. If Endrin breakdown is > 20% on quantitation column, beginning with the samples following the last in control standard:

1. Flag all positive Endrin results "J".
2. If Endrin was not detected, but Endrin Aldehyde and/or Endrin Ketone are positive, flag the Endrin non-detect "R".
3. Flag Endrin Ketone positive results "JN".
4. If Endrin breakdown is > 20% on confirmation column and Endrin is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin should be reported on Form I (if reported, flag result "N").

c. If the combined breakdown is used (it can only be used if the conditions in 7.4 above are met) and is > 20% on quantitation column beginning with the last in control standard, take the actions specified in 7.4 a and b above. If the combined breakdown is >20% on confirmation column and Endrin or DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin or DDT should be reported on Form I (if reported, flag result "N").

	YES	NO	N/A
7.5 Is the linearity check RSD of all four calibration factors <10% for the quantitation column?	[X]	___	___
ACTION: If no, flag positive hits for all pesticide and PCB analytes "J" for all associated samples. Do not flag toxaphene or DDT if they are quantified from a 3-point calibration curve.			
7.6 Is the % difference between the EVAL A and each analysis (quantitation and confirmation) DBC retention time within QC limits (2% for packed column, 0.3% for capillary [I.D. < 0.32 mm], 1% for megabore [0.32 < I.D. < 2 mm]) ?	[X]	___	___
ACTION: DBC retention time cannot be evaluated if DBC is not detected. If it is present and has a retention time out of QC limits, then use professional judgement to determine the reliability of the analysis and flag results "R", if appropriate.			
7.7 Was the proper analytical sequence followed for each 72 hour period of analyses (page PEST D-36 in 8/87 SOW).	[X]	___	___
ACTION: If no, use professional judgement to determine the severity of the effect on the data and accept or reject it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.			
8.0 Pesticide/PCB Standards Summary			
8.1 Is Form IX present and complete for each GC column and 72 hr sequence of analyses?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
8.2 Are there any transcription/calculation errors between raw data and Form IX?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
8.3 Is DDT retention time for packed columns > 12 min (except OV-1 and OV-101 columns)?	[___]	___	X
ACTION: If no, check that there is adequate resolution between individual components. If not, flag results for compounds that interfere with each other (co-elute) "R".			
8.4 Do all standard retention times fall within the windows established for the first IND A and IND B analyses?	[___]	X	___

	YES	NO	N/A
ACTION: Beginning with the samples following the last in control standard, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times. If no peaks are found and, DBC is visible non-detects are valid. If peaks are present and cannot be identified through "pattern recognition" or a consistent shift in standard retention times, flag all affected compound results "R".			
8.5 Are the continuing calibration standard calibration factors within 15% (for quantitation column) or 20% (for confirmation column) of the initial (at beginning of 72 hr sequence) calibration factors?	[ ]	[X]	
ACTION: If no, flag all associated positive results "J". Use professional judgement to determine whether or not to flag non-detects.			
9.0 Pesticide/PCB Identification			
9.1 Is Form X complete for every sample in which a pesticide or PCB was detected?	[X]		
ACTION: If no, take action specified in 3.2 above.			
9.2 Are there any transcription errors between raw data and Form X?		[X]	
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
9.3 Are retention times of sample compounds within the calculated retention time windows for both quantitation and confirmation analyses?	[X]		
Was GC/MS confirmation provided when required (when compound concentration is > 10 ug/ml in final extract)?	[ ]		X
ACTION: Reject ("R") all positive results (meeting quantitation column criteria, but missing confirmation by a second column or GC/MS (if appropriate). Also, reject ("R") all positive results not meeting retention time window criteria unless associated standard compounds are similarly biased (i.e. base on RRT to DBC).			
9.4 Check chromatograms for false negatives, especially for the multiple peak components toxaphene and PCB's. Were there any false negatives?		[X]	
ACTION: If appropriate PCB standards were not analyzed, or if the lab performed no confirmation analysis, flag the appropriate data with an "R".			

	YES	NO	N/A
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Were any errors found?	___	[X]	___
NOTE: Simple peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.			
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[___]	___
ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.			
11.0 Chromatogram Quality			
11.1 Were baselines stable?	[X]	___	___
11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?	___	[X]	___
11.3 Were early eluting peaks (for early eluting analytes) resolved to baseline?	[X]	___	___
ACTION: For 11.1 and 11.2, comment only. For 11.3, reject ("R") those analytes that are not sufficiently resolved.			

	YES	NO	N/A
12.0 Field Duplicates			
12.1 Were any field duplicates submitted for PEST/PCB analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

TOTAL REVIEW

CLP DATA ASSESSMENT

Functional Guidelines for Evaluating Organics Analysis

Case No._____ SDG No. 19B/A Laboratory Canonie Site_____

DATA ASSESSMENT:

The current functional guidelines (1988) for evaluating organic data have been applied.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "U" (non-detects), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). All action is detailed on the attached sheets.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Reviewer's Signature: Jill Haschke **Date:** 9-17-90

Reviewer's Signature: William T Fee **Date:** 9-17-90

Verified By: Anthony W. Toth **Date:** 9-17-90

DATA ASSESSMENT:

1. **Holding Time:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R" if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No action was taken because all holding times were met.

DATA ASSESSMENT

2. Blank Contamination:

Quality assurance (QA) blanks, i.e., method, trip field, rinse and water blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) Method Blank contamination

Semi-volatile: No action was taken because the method blank contaminant was not found in the samples.

Pesticide/PCB: No method blank contamination.

B) Field or rinse blank contamination ("water blanks" or "distilled water blanks" are validated like any other sample)

Semi-volatile: Nine TICs were found in sample 30A, the field blank. One of these, 1,2-Benzenedicarboxylic acid, was found in samples 21B and 22B at less than the 5x criteria. Therefore, this TIC was rejected "R" in these two samples.

The field blank (30A) was collected with all samples except sample 40B. Thus, field blank contamination did not apply to sample 40B.

Pesticide/PCB: No field or rinse blank contamination. (Sample 40A had no associated field or rinse blank.)

C) Trip blank contamination

A trip blank was not included with these samples.

DATA ASSESSMENT:

3. Mass Spectrometer Tuning:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable, "R".

All criteria were met.

DATA ASSESSMENT:

4. Calibration:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05 in both the initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected ("R").

Semi-volatiles: No action was taken.

Pesticide/PCB: In the analyses of Individual Mix B of 6/16/90 (0107) on both columns, several compounds fell outside their retention time windows. In addition, in Individual Mix B of 6/15/90 (2215) on the RTX-35 column, Endrin Ketone fell outside its retention time window. The data were not affected and no action was necessary.

DATA ASSESSMENT:

5. Calibration:

A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <30% and %D must be <25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ" (if %D or RSD >50%). If there is a gross deviation of %RSD and %D, the non-detects may be rejected ("R").

For the PCB/Pesticide fraction, %RSD for aldrin, endrin, DDT, and dibutylchlorendate must not exceed 10%. Percent D must be within 15% on the quantitation column and 20% on the confirmation column.

Semi-volatile: Pyrene's %Ds exceeded 50% in the 6/13/90, 6/14/90, and 6/15/90 continuing calibrations. The non-detects for Pyrene in all samples were estimated "UJ".

3,3-Dichlorobenzidine's %D exceeded 50% in the 6/13/90 continuing calibration. The non-detect for 3,3-Dichlorobenzidine in samples 40B and SBLK01 (soil) were estimated "UJ".

Benzyl Alcohol's %D exceeded 200% in the 6/18/90 continuing calibration. As this calibration applied to only the method blank, the result for Benzyl Alcohol was rejected "R" for SBLK01 (water).

Several compounds including the surrogates had %Ds exceeding 25%. However, no action was required because there were no positive results for these compounds. Surrogate recoveries may have been affected.

Pesticide/PCB: Although there were %Ds which exceeded 15%, the 15 %D criteria was met on at least one column for all calibrations. No action was necessary.

The 20 %D criteria (Form 9) was not met for beta-BHC in the analysis of Individual Mix B on 6/16/90 (0107) on the RTX-5 column. This was the last standard of the sequence. The data were not affected and no action was necessary.

DATA ASSESSMENT:

6. Surrogates:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

Semi-volatiles: Surrogate recoveries for the reanalysis of the water method blank were transcribed onto a soil surrogate recovery form. Surrogate recoveries were within QC limits for water matrices.

It appears that surrogates may have been added at twice the concentration level in sample 30A because percent recoveries were traceable based on concentrations of 100 ppb and 200 ppb. Assuming this was the case, the recovery of Nitrobenzene-d5 fell below the QC limit. However, no action is required when only one surrogate fails QC limits in semi-volatile fractions.

The recovery of the surrogate phenol-d5 was less than 10% in the water matrix spike duplicate. No action was taken because results for the MS/MSD are not qualified.

Pesticide/PCB: Recovery of surrogate Dibutylchlorendate (DBC) was below the criteria in sample 20A. Therefore, all results in sample 20A were estimated "J".

The surrogate recoveries reported on Form 2 were generated from the confirmation column (RTX-35). Therefore, surrogate recoveries were recalculated using the primary column (RTX-5), handwritten onto Form 2, and used for qualification.

DATA ASSESSMENT:

7. Internal Standards Performance:

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more that +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

Samples with internal standard areas outside criteria were reanalyzed and internal standard area criteria were met upon reanalyses. Thus no action was taken.

DATA ASSESSMENT:

8. Compound Identification:

A) Volatile and Semi-volatile fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within +/- 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

B) Pesticide Fraction

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeded 10 ng/ml in the final sample extract.

Semi-volatiles: The mass spectra did not confirm the identity of Benzoic Acid found in samples 19B, 20B, 21B, and 22B. Therefore the results for Benzoic Acid were considered false positives and the results were changed to non-detects.

Xylene, a VOA TCL was reported as a TIC in sample 21B. Therefore this compound was rejected "R".

Several of the TICs reported in the samples had areas less than 10% of the nearest internal standard. These TICs did not need to be reported on Form 1F.

Identified TICs were qualified with an "N" as directed by the Functional Guidelines.

Pesticide/PCB: No problems.

DATA ASSESSMENT:

9. Matrix Spike/Spike Duplicate, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for some additional qualification of the data.

Throughout the case, the water matrix spike/matrix spike duplicate associated with sample 30A was referred to as 30A MS/MSD. However, the extraction records indicated that a blank spike and blank spike duplicate were prepared. Upon conferring with the laboratory, the analysis was determined to have been performed on a blank spike instead of sample 30A. Apparently, the laboratory did not receive the appropriate volume of the sample in order to extract for semi-volatile, pesticide/PCB and matrix spike/matrix spike duplicates. Therefore, all questions on the checklist pertaining to the water MS/MSD were answered using the blank spike/blank spike duplicate data.

Semi-volatiles: The percent recovery for 2,4-Dinitrotoluene exceeded QC limits in the matrix spike and matrix spike duplicate analyses on sample 19B and the percent recovery for Acenaphthene exceeded QC limits in the water matrix spike analysis. Additionally, the RPDs for Acenaphthene and Pyrene exceeded QC limits in the water MS/MSD. This did not warrant any qualification.

Pesticide/PCB: The RPD for Dieldrin exceeded the criteria in the water blank spike data. No action was necessary.

DATA ASSESSMENT:

10. Other QC Data Out of Specification:

None.

11. System Performance and Overall Assessment (continued on next page if necessary):

Semi-volatiles: Sample chromatograms for the BNA analyses exhibited a slight rise in baseline at elevated temperatures. The overall quality of the data did not appear to be affected.

The CRQLs reported for 3,3-Dichlorobenzidine on Form 1 for samples 20B and 21B were incorrect. The correct values were added.

The 20 ppb standard used for the 6/4/90 initial calibration on instrument MS04 was analyzed more than 12 hours after the other four standards. The 20 ppb standard that was listed on Form 5 (pg. 28) was not used. Although this is not standard practice, no action was taken because this initial calibration was only associated with the method blank.

(continued next page)

12. Contract Problems----Non-Compliance

None.

13. This package contains re-extraction, re-analysis or dilution. Upon reviewing the QA results, the following form I(s) are identified to be used.

Semi-volatiles: Sample 22B was reanalyzed because of internal standard problems. Since only the one Form 1 from the reanalysis was submitted, this summary was used.

DATA ASSESSMENT:

11. System Performance and Overall Assessment (continued):

The water matrix spike Form 1B was submitted, however, quantitation information was not included. The summary data on Form 3C was used.

The concentrations listed for the surrogates on the quantitation report for the water method blank could not be traced to the raw data using the RRF from the 6/18/90 continuing calibration. The recalculated values were within percent recovery limits and no action was taken.

Various samples and blank chromatograms listed detections greater than 1 ppb for several compounds. As these compounds were not reported they may have been detected below the instrument detection limits. If this is the circumstance the laboratory should consider including IDLs.

Pesticide/PCB: On the Organics Extractions Report, the final volume of each soil sample extract was listed as 10 milliliters. After review with the laboratory, this volume was actually determined to be 1 milliliter.

SOP NO. HW-6
Revision #6

CLP ORGANICS DATA REVIEW AND PRELIMINARY REVIEW

URRED BY: _____ Date: 4/6/89
Louis Bavilacqua
Monitoring Management Branch

OVED BY: _____ Date: 4/14/89
Gerard F. McKenna, Chief
Monitoring Management Branch

INTRODUCTION TO DATA VALIDATION

) Scope

..1 This procedure is applicable to organic data obtained from contractor laboratories working for the Contract Laboratory Program (CLP).

..2 The data validation is based upon analytical and quality assurance requirements specified in the Statement of Work (SOW).

) Responsibilities

)ata reviewers will complete the following tasks as assigned by the Data Review Coordinator:

).1 Data Assessment - The reviewer must answer every question on the checklist. All response shall be in ink.

).2 Data Assessment Narrative (Attachment 1) - Data reviewer is required to use these forms and must match the action in the narrative with the action taken on the Form I(s).

).3 Rejection Summary Form (Attachment 2) - Fill in the total number of analytes measured by different analyses and the number of analytes rejected or flagged as estimated due to corresponding quality control criteria. Place an "X" in the boxes where analyses were not performed or criteria do not apply.

2.4 Organic Regional Data Assessment - Data reviewer is also required to fill out Organic Regional Data Assessment Form (Attachment 3).

2.5 Telephone Record Log - The data reviewer should enter the bare facts of inquiry before initiating any authorized telephone conversation with a CLP laboratory. After the case review has been completed, mail the white copy of the Telephone Record Log to the laboratory and the pink copy to SMO. File the yellow copy in the Telephone Record Log folder and attach a photocopy of the Telephone Record Log to the completed Data Assessment Narrative.

2.6 Forwarded Paperwork - Upon completion of the review, the following are to be forwarded to the Regional Sample Control Center (RSCC) located in the Surveillance and Monitoring Branch:

a. data package
b. completed assessment checklist
c. SMO Contract Compliance Screening (CCS)

Forward four (4) copies of the completed Data Assessment Narrative along with four (4) copies of the Organic Data Assessment Form: one each for the appropriate Regional DPO, the Sample Management Office (SMO), and to the last two addresses of the Data Reviewers Mailing List.

2.7 Filed Paperwork - Upon completion of the review, the following are to be filed within the Monitoring and Management Branch (MMB) files:

a. Telephone record Log (copy)
b. Record of Communication (original)
c. Rejection Summary Form

Rejection of Data - All values determined to be unacceptable on the Organic Analysis Data Sheet (Form I) must be flagged with an "R". As soon as review criteria causes data to be rejected, that data can be eliminated from any further review or consideration.

Acceptance Criteria - In order that the reviews be consistent among reviewers, this Standard Operating Procedure (SOP) should be used. Additional guidance can be found in the Functional Guidelines.

SMO Contract Compliance Screening (CCS) - This is intended to aid the reviewer in locating any problems, both corrected and uncorrected. However, the validation should be carried out even if CCS is not present. Resubmittals received from the laboratory in response to CCS must be used by the reviewer.

PAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: SDG: 50A/B

LAB: Canonie Environmental

SITE:

Data Completeness and Deliverables	YES	NO	N/A
1.1 Have any missing deliverables been received and added to the data package.	[___]	___	X
ACTION: Call lab for explanation / resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the package under the "Contract Problems/Non-compliance" section of reviewer narrative.			
1.2 Was SMO CCS checklist included with package?	[___]	X	___
Cover Letter/Case Narrative			
2.1 Is the Narrative or Cover Letter present?	[X]	___	___
2.2 Are Case Number and/or SAS number contained in the Narrative or Cover Letter?	[___]	X	___

Data Validation Checklist

The following checklist is divided into three parts. Part A is filled out if the data package contains any VOA analyses, Part B for any BNA analyses and Part C for Pesticide/PCBs.

Does this package contain:

VOA data?	___	X
BNA data?	X	___
Pesticide/PCB data?	X	___

ACTION: Complete corresponding parts of checklist.

	YES	NO	N/A

PART B: BNA ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [X] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? X [ ] ___

ACTION: Use professional judgement to evaluate the effect on the quality of the data.

ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.

2.0 Holding Times

2.1 Have any BNA holding times, determined from date of collection to date of extraction, been exceeded? ___ [X] ___

Samples for BNA analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.

Table of Holding Time Violations

Sample	Sample Matrix	Date Sampled	(See Traffic Report) Date Lab Received	Date Extracted	Date Analyzed
None					

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

	YES	NO	N/A
If analyses were done more than 14 days beyond holding time, either on the first analysis or upon reanalysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. The reviewer may determine that non-detect data are unusable ("R").			
3.0 Surrogate Recovery (Form II)			
3.1 Are the BNA Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the BNA samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.			
3.3 Were outliers marked correctly with an asterisk?	[X]	___	___
ACTION: Circle all outliers in red.			
3.4 Were two or more base-neutral OR acid surrogate recoveries out of specification for any sample or method blank?	___	[X]	___
If yes, were samples reanalyzed?	[___]	___	X
Were method blanks reanalyzed?	[___]	___	X
ACTION: If all BNA surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet SOW specifications, for the affected fraction only (i.e. base-neutral OR acid compounds):			
1. Flag all positive results as estimated ("J").			
2. Flag all non-detects as estimated detection limits ("UJ").			

	YES	NO	N/A
If any base-neutral or acid surrogate has a recovery of <10% : 1. Flag all positive results for that fraction (i.e. all acid or base-neutral compounds) "J". 2. Flag all non-detects for that fraction "R". Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and re-analyses. Check the internal standard areas.			
3.5 Are there any transcription/calculation errors between raw data and Form II?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
4.0 Matrix Spikes (Form III)			
4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present?	[X]	___	___
4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:			
a. Low Water	[___]	X	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.			

4.3 How many BNA spike recoveries are outside QC limits?

Water	Soils
7 out of 22	0 out of 22

4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Soils
0 out of 11	0 out of 11

ACTION: If MS and MSD both have less than 10% recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples

	YES	NO	N/A
5.0 Blanks (Form IV)			
5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of BNA TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	[X]	___	___
ACTION: Use professional judgement to determine the effect on the data.			
6.0 Contamination			
NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.			
6.1 Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for BNAs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive BNA results (TCL and/or TIC)?	X	[___]	___
ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)			
NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.			

YES NO N/A

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

	Sample conc > CRQL but < 10x blank	Sample conc < CRQL & is < 10x blank value	Sample conc > CRQL value & >10x blank value
Common Phthalate Esters	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

	Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL value & > 5 blank value
Other Contaminants	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" (unusable).

6.3 Are there field/rinse/equipment blanks associated with every sample? [X] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 GC/MS Tuning and Mass Calibration (Form V)

7.1 Are the GC/MS Tuning and Mass Calibration Forms (Form V) present for Decafluorotriphenylphosphine (DFTPP)? [X] ___ ___

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? [X] ___ ___

7.3 Has a tuning performance compound been analyzed for every twelve hours of sample analysis per instrument? [X] ___ ___

ACTION: If any tuning data are missing, take action specified in 3.2 above.

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
			None

YES NO N/A

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundance criteria been met for each instrument used? [X] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If tuning calibration is in error, flag all associated sample data as unusable ("R"). However, if expanded ion criteria are met (See 1988 Functional Guidelines), the data reviewer may accept data with appropriate qualifiers.

7.5 Are there any transcription / calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.) ___ [X] ___

7.6 Have the appropriate number of significant figures (two) been reported? (Check at least two values, but if errors are found check more values.) X [___] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make necessary corrections and note errors under "Conclusions".

7.7 Are the spectra of the mass calibration compound acceptable? [X] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

8.0 Target Compound List (TCL) Analytes

8.1 Are the Organic Analysis Data Sheets (Form I BNA) present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [X] ___ ___

b. Matrix spikes and matrix spike duplicates [X] ___ ___

c. Blanks [X] ___ ___

	YES	NO	N/A
8.2 Are the BNA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[X]	___	___
c. Blanks	[X]	___	___
ACTION: If any data are missing, take action specified in 3.2 above.			
8.3 Are the response factors shown in the Quant Report?	[___]	X	___
8.4 Is chromatographic performance acceptable with respect to:			
Baseline stability	[X]	___	___
Resolution	[X]	___	___
Peak shape	[X]	___	___
Full-scale graph (attenuation)	[X]	___	___
Other:_____	[___]	___	X
ACTION: Use professional judgement to determine the acceptability of the data.			
8.5 Are the lab-generated standard mass spectra of the identified BNA compounds present for each sample?	[___]	___	X
ACTION: If any mass spectra are missing, take action specified in 3.2 above. If Lab does not generate their own standard spectra, make note in "Contract Problems/Non-compliance".			
8.6 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[___]	___	X
8.7 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	[___]	___	X
8.8 Do sample and standard relative ion intensities agree within 20%?	[___]	___	X
ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected, flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected (at the calculated detection limit).			

	YES	NO	N/A
9.0 Tentatively Identified Compounds (TIC)			
9.1 Are all Tentatively Identified Compound Forms (Form I, Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "J" qualifier?	[X]	___	___
9.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Blanks	[X]	___	___
ACTION: If any TIC data are missing, take action specified in 3.2 above.			
ACTION: Add "J" qualifier if missing and "N" qualifier to all identified TIC compounds on Form I, Part B.			
9.3 Are any TCL compounds (from any fraction) listed as TIC compounds (example: 1,2-dimethylbenzene is xylene--a VOA TCL--and should not be reported as a TIC)?	___	[X]	___
ACTION: Flag with "R" any TCL compound listed as a TIC.			
9.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
9.5 Do TIC and "best match" standard relative ion intensities agree within 20%?	[X]	___	___
ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate.			
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	[X]	___
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[___]	___

	YES	NO	N/A

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration?	[X]	___	___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete for the BNA fraction?	[X]	___	___

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

12.2 Are response factors stable for BNAs over the concentration range of the calibration (RSD <30%)?	[___]	X	___

ACTION: Circle all outliers in red.

ACTION: When RSD >30%, non-detects may be qualified using professional judgement. Flag all positive results "J". When RSD >90%, flag all non-detects as unusable ("R"). (Region II policy.)

12.3 Do any compounds have a RRF < 0.05?	___	[X]	___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has an average RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

	YES	NO	N/A
12.4 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or %RSD? (Check at least two values but if errors are found, check more.)	___	[X]	___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

13.0 GC/MS Continuing Calibration (Form VII)

13.1 Are the Continuing Calibration Forms (Form VII) present and complete for the BNA fraction?	[X]	___	___
13.2 Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	[X]	___	___

ACTION: List below all sample analyses that were not within twelve hours of the previous continuing calibration analysis.

_____

_____

_____

ACTION: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, call lab for explanation / resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

13.3 Do any continuing calibration standard compounds have a RRF < 0.05?	___	[X]	___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has a RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

13.4 Do any compounds have a % difference between initial and continuing calibration RRF > 25%?	X	[___]	___

ACTION: Circle all outliers in red and qualify associated sample data as outlined in the table below:

YES NO N/A

% DIFFERENCE

25-50	50-90	>90
'J' positive results, no action for non detects	'J' positive results, 'UJ' non detects	'J' positive results, "R" non detects

13.5 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more.) ___ [X] ___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

14.0 Internal Standards (Form VIII)

14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits for each continuing calibration? [X] ___ ___

ACTION: List all the outliers below.

Sample #	Internal Std	Area	Lower Limit	Upper Limit

(Attach additional sheets if necessary.)

ACTION: If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard. If extremely low area counts are reported, or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable ("R").

14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard? [X] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

	YES	NO	N/A
15.0 Field Duplicates			
15.1 Were any field duplicates submitted for BNA analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

	YES	NO	N/A
PART C: PESTICIDE/PCB ANALYSES			
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are the Traffic Report Forms present for all samples?	[X]	___	___
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?	X	[___]	___
ACTION: Use professional judgement to evaluate the effect on the quality of the data.			
ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.			
2.0 Holding Times			
2.1 Have any PEST/PCB holding times, determined from date of collection to date of extraction, been exceeded?	___	[X]	___
Samples for PEST/PCB analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.			
3.0 Surrogate Recovery (Form II)			
3.1 Are the PEST/PCB Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the PEST/PCB samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

	YES	NO	N/A

ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.

3.3 Were outliers marked correctly with an asterisk? [ ] ___ X

ACTION: Circle all outliers in red.

3.4 Was surrogate (DBC) recovery outside of the contract specification for any sample or blank? ___ [X] ___

ACTION: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J" and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewers professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

3.5 Are there any transcription/calculation errors between raw data and Form II? ___ [X] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present? [X] ___ ___

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] X ___

b. Med Water [ ] ___ X

c. Low Soil [X] ___ ___

d. Med Soil [ ] ___ X

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.

4.3 How many PEST/PCB spike recoveries are outside QC limits?

Water	Soils
2 out of 12	3 out of 12

	YES	NO	N/A
4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			

Water	Soils
4 out of 6	3 out of 6

ACTION: If MS and MSD both have less than zero recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples.

5.0 Blanks (Form IV)

5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of Pesticide TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts. Is the chromatographic performance (baseline stability) for each instrument acceptable for PEST/PCBs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for PEST/PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive PEST/PCB results?	___	[X]	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

YES NO N/A

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL & > 5x blank value
Flag sample result with a "U"; cross out "B" flag	Reject sample result and report CRQL; cross out "B" flag	No qualification is needed

6.3 Are there field/rinse/equipment blanks associated with every sample? [X] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 Calibration and QC Performance

7.1 Are the following Gas Chromatograms and Data System Printouts for both Primary and Confirmation (confirmation standards not required if there are no positive results above CRQL) column present:

a. Evaluation Standard Mix A [X] ___ ___

b. Evaluation Standard Mix B [X] ___ ___

c. Evaluation Standard Mix C [X] ___ ___

d. Individual Standard Mix A [X] ___ ___

e. Individual Standard Mix B [X] ___ ___

f. Multi-component Pesticides Toxaphene & Chlordane [X] ___ ___

g. Aroclors 1016/1260 [X] ___ ___

h. Aroclors 1221, 1232, 1242, 1248, and 1254 [X] ___ ___

ACTION: If no, take action specified in 3.2 above

	YES	NO	N/A
7.2 Is Form VIII Pest-1 present and complete for each GC column (primary and confirmation) and each 72 hour sequence of analyses?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
7.3 Are there any transcription/calculation errors between raw data and Form VIII?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
7.4 Has the total breakdown on quantitation or confirmation column exceeded 20% for DDT?	___	[X]	___
- for Endrin?	___	[X]	___
or if Endrin aldehyde and 4,4'-DDD co-elute and there is a peak at their retention time, has the combined DDT and Endrin breakdown exceeded 20%?	___	[___]	X

ACTION:

a. If DDT breakdown is greater than 20% on quantitation column beginning with the samples following the last in control standard:

1. Flag all positive DDT results "J".
2. If DDT was not detected but DDD and/or DDE are positive, flag the DDT non-detect "R".
3. Flag positive DDD and DDE results "JN".
4. If DDT breakdown is > 20% on confirmation column and DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether DDT should be reported on Form I (if reported, flag result "N").

b. If Endrin breakdown is > 20% on quantitation column, beginning with the samples following the last in control standard:

1. Flag all positive Endrin results "J".
2. If Endrin was not detected, but Endrin Aldehyde and/or Endrin Ketone are positive, flag the Endrin non-detect "R".
3. Flag Endrin Ketone positive results "JN".
4. If Endrin breakdown is > 20% on confirmation column and Endrin is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin should be reported on Form I (if reported, flag result "N").

c. If the combined breakdown is used (it can only be used if the conditions in 7.4 above are met) and is > 20% on quantitation column beginning with the last in control standard, take the actions specified in 7.4 a and b above. If the combined breakdown is >20% on confirmation column and Endrin or DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin or DDT should be reported on Form I (if reported, flag result "N").

	YES	NO	N/A
7.5 Is the linearity check RSD of all four calibration factors <10% for the quantitation column?	[X]	___	___
ACTION: If no, flag positive hits for all pesticide and PCB analytes "J" for all associated samples. Do not flag toxaphene or DDT if they are quantified from a 3-point calibration curve.			
7.6 Is the % difference between the EVAL A and each analysis (quantitation and confirmation) DBC retention time within QC limits (2% for packed column, 0.3% for capillary [I.D. < 0.32 mm], 1% for megabore [0.32 < I.D. < 2 mm]) ?	[X]	___	___
ACTION: DBC retention time cannot be evaluated if DBC is not detected. If it is present and has a retention time out of QC limits, then use professional judgement to determine the reliability of the analysis and flag results "R", if appropriate.			
7.7 Was the proper analytical sequence followed for each 72 hour period of analyses (page PEST D-36 in 8/87 SOW).	[X]	___	___
ACTION: If no, use professional judgement to determine the severity of the effect on the data and accept or reject it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.			

8.0 Pesticide/PCB Standards Summary

8.1 Is Form IX present and complete for each GC column and 72 hr sequence of analyses?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
8.2 Are there any transcription/calculation errors between raw data and Form IX?	X	[___]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
8.3 Is DDT retention time for packed columns > 12 min (except OV-1 and OV-101 columns)?	[___]	___	X
ACTION: If no, check that there is adequate resolution between individual components. If not, flag results for compounds that interfere with each other (co-elute) "R".			
8.4 Do all standard retention times fall within the windows established for the first IND A and IND B analyses?	[X]	___	___

	YES	NO	N/A
ACTION: Beginning with the samples following the last <u>in control</u> standard, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times. If no peaks are found and, DBC is visible non-detects are valid. If peaks are present and cannot be identified through "pattern recognition" or a consistent shift in standard retention times, flag all affected compound results "R".			
8.5 Are the continuing calibration standard calibration factors within 15% (for quantitation column) or 20% (for confirmation column) of the initial (at beginning of 72 hr sequence) calibration factors?	[___]	X	___
ACTION: If no, flag all associated positive results "J". Use professional judgement to determine whether or not to flag non-detects.			
9.0 <u>Pesticide/PCB Identification</u>			
9.1 Is Form X complete for every sample in which a pesticide or PCB was detected?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
9.2 Are there any transcription errors between raw data and Form X?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
9.3 Are retention times of sample compounds within the calculated retention time windows for both quantitation and confirmation analyses?	[X]	___	___
Was GC/MS confirmation provided when required (when compound concentration is > 10 ug/ml in final extract)?	[___]	___	X
ACTION: Reject ("R") all positive results (meeting quantitation column criteria, but missing confirmation by a second column or GC/MS (if appropriate). Also, reject ("R") all positive results not meeting retention time window criteria unless associated standard compounds are similarly biased (i.e. base on RRT to DBC).			
9.4 Check chromatograms for false negatives, especially for the multiple peak components toxaphene and PCB's. Were there any false negatives?	___	[X]	___
ACTION: If appropriate PCB standards were not analyzed, or if the lab performed no confirmation analysis, flag the appropriate data with an "R".			

	YES	NO	N/A
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Were any errors found?	___	[X]	___
NOTE: Simple peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.			
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[___]	___
ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.			
11.0 Chromatogram Quality			
11.1 Were baselines stable?	[X]	___	___
11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?	___	[X]	___
11.3 Were early eluting peaks (for early eluting analytes) resolved to baseline?	[X]	___	___
ACTION: For 11.1 and 11.2, comment only. For 11.3, reject ("R") those analytes that are not sufficiently resolved.			

	YES	NO	N/A
12.0 Field Duplicates			
12.1 Were any field duplicates submitted for PEST/PCB analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

TOTAL REVIEW

CLP DATA ASSESSMENT

Functional Guidelines for Evaluating Organics Analysis

Case No._____ SDG No. 50A/B Laboratory Canonie Site_____

DATA ASSESSMENT:

The current functional guidelines (1988) for evaluating organic data have been applied.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "U" (non-detects), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). All action is detailed on the attached sheets.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Reviewer's Signature: William T Fee Date: 9/11/90

Reviewer's Signature: Jill Haschke Date: 9-17-90

Verified By: Anthony W. Toth Date: 9-17-90

DATA ASSESSMENT:

1. Holding Time:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No action was taken because all holding times were met.

DATA ASSESSMENT

2. **Blank Contamination:**

Quality assurance (QA) blanks, i.e., method, trip field, rinse and water blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) **Method Blank contamination**

Semi-volatile: No method blank contamination.

Pesticide/PCB: No method blank contamination.

B) **Field or rinse blank contamination ("water blanks" or "distilled water blanks" are validated like any other sample)**

Semi-volatile: Seven unknown TICs were found in the rinse blank (sample 60ABC). TICS in the samples were not qualified because the rinse blank TICs were not identified and since the rinse blank was analyzed on a different instrument, retention times will not agree.

Pesticide/PCB: No field or rinse blank contamination.

C) **Trip blank contamination**

A trip blank was not included with these samples.

DATA ASSESSMENT:

3. Mass Spectrometer Tuning:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable, "R".

All criteria were met and no action was taken.

DATA ASSESSMENT:

4. Calibration:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05 in both the initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected ("R").

Semi-volatiles: All response factors were greater than 0.05 and no action was taken.

Pesticide/PCB: The calibration factors reported on the Form 9s for Toxaphene were not reproducible (on either column); therefore, they were changed. The data was not affected.

DATA ASSESSMENT:

5. Calibration:

A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <30% and %D must be <25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ" (if %D or RSD >50%). If there is a gross deviation of %RSD and %D, the non-detects may be rejected ("R").

For the PCB/Pesticide fraction, %RSD for aldrin, endrin, DDT, and dibutylchlorendate must not exceed 10%. Percent D must be within 15% on the quantitation column and 20% on the confirmation column.

Semi-volatiles: The initial and continuing calibrations had compounds whose %RSDs or %Ds exceeded 30% and 25%, respectively. No action was required because there were no positive results for these compounds in the associated samples.

The %D for 4-Nitroaniline exceeded 50% in the 8/16/90 continuing calibration. Since this calibration was only associated with the blank matrix spike duplicate, no action was taken because MS/MSD data is not generally qualified.

Pesticide/PCB: In the continuing calibration of Individual Mix B on 8/20/90 (0407), Endosulfan Sulfate's %Ds exceeded 20% on both columns. No action was necessary because there were no positive results for this compound.

DATA ASSESSMENT:

6. Surrogates:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

Semi-volatile: Several samples had a single surrogate recovery outside QC limits. However no action is required when only one surrogate fails QC limits in a semi-volatile fraction.

The matrix spike duplicate had one (base/neutral) surrogate and one (acid) surrogate outside recovery limits. No action was required.

It appears that the surrogates were added to all water samples and blanks at twice their normal concentration because the percent recoveries were reproducible using 100 ppb and 200 ppb instead of 50 ppb and 100 ppb for the appropriate fractions.

Pesticide/PCB: None.

DATA ASSESSMENT:

7. Internal Standards Performance:

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more that +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

All internal standard area criteria were met.

DATA ASSESSMENT:

8. Compound Identification:

A) Volatile and Semi-volatile fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within +/- 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

B) Pesticide Fraction

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeded 10 ng/ml in the final sample extract.

Semi-volatile: Identified TICs were qualified with an "N" as specified in the guidelines.

A few TCL compounds detected at low concentrations and listed on the quantitation reports for several samples were marked out by the analyst. These changes should have been initialed and dated by the analyst.

Pesticide/PCB: No problems.

DATA ASSESSMENT:

9. Matrix Spike/Spike Duplicate, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for some additional qualification of the data.

Throughout the case, the water matrix spike/matrix spike duplicate associated with sample 60ABC was referred to as 60ABC MS/MSD. However, the extraction records indicated that a blank spike and blank spike duplicate were prepared. Upon conferring with the laboratory, the analysis was determined to have been performed on a blank spike instead of sample 60ABC. Apparently, the laboratory did not receive the appropriate volume of sample in order to extract for semi-volatile, pesticide/PCB and matrix spike/matrix spike duplicates. Therefore, all questions on the checklist pertaining to the water MS/MSD were answered using the blank spike/blank spike duplicate data.

Semi-volatiles: The compounds 4-Nitrophenol, 2,4-Dinitrotoluene and Pentachlorophenol had spike recoveries of 0% in the blank spike and blank spike duplicate (60ABC MS/MSD). Therefore, the non-detected results for these three compounds in the associated sample 60ABC were rejected "R". (Additionally, the percent recovery of Pyrene exceeded QC limits in this MSD.)

The incorrect sample ID number was transcribed onto Form 1s for the MS/MSD on sample 50A. This was corrected.

Pesticide/PCB: The percent recoveries of gamma-BHC and 4,4'-DDT in the water blank spike duplicate, and the RPDs of gamma-BHC, Dieldrin, Endrin, and 4,4'-DDT were outside of criteria in the water blank spike data.

In the soil spike analyses, Dieldrin, Endrin, and 4,4'-DDT were not recovered in the matrix spike duplicate and had RPDs which exceeded the criteria.

These problems associated with the spike data did not result in any qualification of the data. No action was necessary.

DATA ASSESSMENT:

10. Other QC Data Out of Specification:

The chain-of-custody indicated that the samples were received at 12°C. This may have affected the sample results.

Semi-volatiles: All non-detects in sample 51A were rejected "R" because the sample which was analyzed as a soil contained 90% moisture. Additionally, all non-detects in samples 52A and 53A are estimated "UJ" because these soil samples contained more than 50% moisture.

Pesticide/PCB: All non-detects in sample 51B were rejected "R" because the sample which was analyzed as a soil contained 90% moisture. All non-detects in samples 52B and 53B are estimated "UJ" because these soil samples contained more than 50% moisture.

11. System Performance and Overall Assessment (continued on next page if necessary):

Semi-volatiles: Several chromatograms exhibited a slight rise in baseline at elevated temperatures. The overall quality of the data did not appear to be affected.

Pesticides/PCB: On the Organics Extractions Report, the final volume of each soil extract was listed as 10 milliliters. After review with the laboratory, this volume was actually determined to be 1 milliliter.

12. Contract Problems----Non-Compliance

None.

13. This package contains re-extraction, re-analysis or dilution. Upon reviewing the QA results, the following form I(s) are identified to be used.

None.

DATA ASSESSMENT:

11. System Performance and Overall Assessment (continued):

No additional problems were noted.

QUANTALEX
INCORPORATED

12600 West Colfax Avenue
Suite A-300
Lakewood, Colorado 80215

TEL 303 237-7879
FAX 303 234-5858

April 4, 1991

Mr. Charles E. Mickel
Engineer
Canonie Environmental Services Corporation
94 Inverness Terrace East, Suite 100
Englewood, Colorado 80112

Dear Mr. Mickel:

Enclosed with this transmittal are the validation reports for SDG #C0436 PAS Clothier Semivolatile and Pesticide/PCB analytical data packages.

The data packages were validated and found to be acceptable.

If you have any questions, please call us at (303) 237-7879. We thank you for your business.

Sincerely yours,

Anthony W. Toth

Anthony W. Toth
Staff Consultant

cc: Tom Kreutz, Canonie Environmental Services Corp.
Norm Flynn, Weston Laboratories (enclosures)

Ltr/Charles E. Mickel

TOTAL REVIEW

CLP DATA ASSESSMENT

Functional Guidelines for Evaluating Organics Analysis

Case No._____ SDG No. C0436 Laboratory Weston Site PAS Clothier

DATA ASSESSMENT:

The current functional guidelines (1988) for evaluating organic data have been applied.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "U" (non-detects), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). All action is detailed on the attached sheets.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Reviewer's Signature: Pamela L Rogers Date: 4-4-91

Reviewer's Signature: Derek J Lawrence Date: 4-4-91

Verified By: Anthony W. Toth Date: 4-4-91

DATA ASSESSMENT:

1. **Holding Time:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

Semi-volatiles: All results and quantitation limits in samples CES-28, CES-29, CES-30, CES-31, CES-32, CES-33, CES-34, CES-35, and CES-36 are estimated "J" because the duration from sample collection to extraction exceeded seven days.

Pesticide/PCB: No action is taken because all holding times were met.

DATA ASSESSMENT

2. Blank Contamination:

Quality assurance (QA) blanks, i.e., method, trip field, rinse and water blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) Method Blank contamination

Semi-volatiles: The unknown TIC found in the method blank was also found in all samples at less than the 5x criteria. Therefore, this TIC is rejected "R" in all samples.

Pesticide/PCB: No method blank contamination.

B) Field or rinse blank contamination ("water blanks" or "distilled water blanks" are validated like any other sample)

Semi-volatiles: The following samples had TICs found at less than the 5x criteria that were also found in the rinse blank and are, therefore, rejected "R": CES-28 (6 TICs), CES-29 (1 TIC), CES-30 (4 TICs), CES-31 (5 TICs), CES-33 (4 TICs), CES-34 (1 TIC), CES-35 (4 TICs), and CES-36 (3 TICs). In addition, bis(2-Ethylhexyl) phthalate found in the rinse blank was also found in samples CES-31 and CES-35 at less than the 10x criteria. Therefore, bis(2-Ethylhexyl)phthalate is rejected "R" in these two samples.

Pesticide/PCB: No rinse blank contamination.

C) Trip blank contamination

A trip blank was not included with these samples. Trip blanks are not required for BNA and pesticide analyses.

DATA ASSESSMENT:

3. Mass Spectrometer Tuning:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable, "R".

All criteria were met and no action is taken.

DATA ASSESSMENT:

4. Calibration:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05 in both the initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected ("R").

Semi-volatiles: No action is taken.

Pesticide/PCB: No action is taken.

DATA ASSESSMENT:

5. Calibration:

A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <30% and %D must be <25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ" (if %D or RSD >50%). If there is a gross deviation of %RSD and %D, the non-detects may be rejected ("R").

For the PCB/Pesticide fraction, %RSD for aldrin, endrin, DDT, and dibutylchlorendate must not exceed 10%. Percent D must be within 15% on the quantitation column and 20% on the confirmation column.

Semi-volatiles: The %Ds for 3,3'-Dichlorobenzidine exceeded 50% in the 2/22/91 and 2/26/91 continuing calibrations. The non-detects for 3,3'-Dichlorobenzidine in samples CES-28, CES-30, CES-31, CES-32, CES-33, CES-34, CES-36, and CES-37ABC are estimated "UJ".

The %D for Benzoic Acid exceeded 50% in the 2/22/91 continuing calibration. The non-detect for Benzoic Acid in sample CES-37ABC is estimated "UJ".

The %RSD and %D for 3-Nitroaniline exceeded 50% in the 3/1/91 initial calibration and the 2/26/91 continuing calibration, respectively. The non-detects for 3-Nitroaniline in all samples except sample CES-37ABC are estimated "UJ".

The %Ds for Pyrene and 4-Nitroaniline exceeded 50% in the 2/26/91 continuing calibration. The non-detects for these compounds in samples CES-28, CES-30, CES-31, CES-32, CES-33, CES-34, and CES-36 are estimated "UJ".

Several compounds (including some surrogates) had %RSD's or %D's exceeding 30% and 25%, respectively. However, no action is required because there were no positive results for these compounds.

Pesticide/PCB: The %D for Endrin exceeded 15% in the analysis of Individual Mix B on 2/26/91 (1502) on the RTX-5 column. Also, the 20 %D criteria were not met for beta-BHC, delta-BHC, Aldrin, 4,4'-DDE, Endrin, and g-Chlordane in the analysis of Individual Mix B on 2/26/91 (1502) on the RTX-35 column. This was the last standard of the sequence. The data do not appear to be affected and no action is necessary.

DATA ASSESSMENT:

5. Calibration:

Pesticide/PCB: (continued from previous page)

The percent breakdown for Endrin exceeded 20% in the analysis of Evaluation Mix B on 2/24/91 (0457) and 2/25/91 (1710) on the RTX-5 column. There were no positive results for Endrin, Endrin Ketone, and Endrin aldehyde. Therefore, no action is taken.

Upon review of Form 8E (Pesticide Evaluation Standards Summary), it was found that 3 samples were analyzed past the 72 hour calibration limit. However, no action is taken because the samples were analyzed within 74 hours and the data does not appear to be affected.

DATA ASSESSMENT:

6. Surrogates:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

Semi-volatiles: The recoveries of the surrogates Terphenyl-d14 and 2,4,6-Tribromophenol were above criteria in samples CES-28, CES-30, and CES-32 and in the matrix spike/matrix spike duplicate performed on sample CES-31. In addition the recovery of 2,4,6-Tribromophenol was above criteria in samples CES-31 and CES-33. No action is required as only one surrogate per fraction (Base/Neutral and/or Acid) was outside criteria in the samples.

Pesticide/PCB: The surrogate recovery reported on Form 2 for sample CES-37ABC is incorrect. The value reported was apparently calculated using an initial sample volume of 1000 mls. Upon review of the extraction log, it was found that the initial sample volume was 880 mls. Therefore, the percent recovery on Form 2 was changed to 66%, which reflects the correct initial volume. No action is taken since the recoveries were within criteria.

DATA ASSESSMENT:

7. Internal Standards Performance:

Internal standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more that +/-30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

The area for the internal Perylene-d12 was outside criteria in the method blank SBLK62. No action is taken.

DATA ASSESSMENT:

8. Compound Identification:

A) Volatile and Semi-volatile fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within +/- 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

B) Pesticide Fraction

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeded 10 ng/ml in the final sample extract.

Semi-volatiles: The mass spectra did not confirm the identity of 4-(1,1-dimethylethyl)phenol as a Tentatively Identified Compound (TIC) in sample CES-29. Therefore, this TIC is changed to an unknown aromatic compound on Form 1F for this sample.

Identified TICs were qualified with an "N" as directed by the Functional Guidelines.

Pesticide/PCB: The calibration factor for Aroclor 1242 found on Form 9 did not match the calibration factor calculated from the Aroclor 1242 raw data on page 162. An apparent Aroclor 1242 peak at relative retention time 10.31 was not included in the calculated value listed on Form 9.

The calculated positive results for Aroclor 1242 for sample CES-29 and CES-31 were verified from the raw data total peak area of the Aroclor 1242 standard. The result for sample CES-33 was changed since the original Form 1 result did not include the peak area at RRT 10.36 in the Aroclor 1242 lab calculation.

DATA ASSESSMENT:

9. Matrix Spike/Spike Duplicate, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for some additional qualification of the data.

Semi-volatiles: The percent recoveries for 2,4-Dinitrotoluene exceeded QC limits in the soil matrix spike and matrix spike duplicate analyses, (Pentachlorophenol in the soil MSD only). Furthermore, the percent recoveries for 4-Nitrophenol and Pentachlorophenol exceeded QC limits in the water MS/MSD. No qualification was warranted as there were no positive results for these compounds in the associated unspiked samples.

Pesticide/PCB: No action is necessary.

DATA ASSESSMENT:

10. Other QC Data Out of Specification:

None.

11. System Performance and Overall Assessment (continued on next page if necessary):

Semi-volatiles: The chromatogram for sample CES-29 exhibited a large (fluctuation) rise in baseline which is apparently a hydrocarbon cluster. Additionally, several sample chromatograms exhibited a slight rise in baseline at elevated temperatures. The overall quality of the data did not appear to be affected.

The positive value for Di-N-Butylphthalate was incorrectly transcribed onto Form 1C for sample CES-31 as a positive result for Fluoranthene. This error is corrected on the Form 1C and no action is necessary, (Fluoranthene was undetected).

The Form 5A for the 3/6/91 (0959) DFTPP tune contained incorrect values for %Relative Abundance. The %Relative Abundance results from the raw data were reviewed and found to be within criteria and no action is taken.

Pesticide/PCB: The baseline on several chromatograms appeared to be somewhat erratic. However, this baseline condition did not appear to have an adverse affect on the data.

12. Contract Problems----Non-Compliance

None.

13. This package contains re-extraction, re-analysis or dilution. Upon reviewing the QA results, the following Form I(s) are identified to be used.

Not applicable.

SOP NO. HW-6
Revision #6

CLP ORGANICS DATA REVIEW AND PRELIMINARY REVIEW

CURRED BY: _____ Date: 4/6/89
Louis Bevilacqua
Monitoring Management Branch

ROVED BY: _____ Date: 4/14/89
Gerard F. McKenna, Chief
Monitoring Management Branch

INTRODUCTION TO DATA VALIDATION

) Scope

..1 This procedure is applicable to organic data obtained from contractor laboratories working for the Contract Laboratory Program (CLP).

..2 The data validation is based upon analytical and quality assurance requirements specified in the Statement of Work (SOW).

) Responsibilities

)ata reviewers will complete the following tasks as assigned by the Data Review Coordinator:

?.1 Data Assessment - The reviewer must answer every question on the checklist. All response shall be in ink.

?.2 Data Assessment Narrative (Attachment 1) - Data reviewer is required to use these forms and must match the action in the narrative with the action taken on the Form I(s).

?.3 Rejection Summary Form (Attachment 2) - Fill in the total number of analytes measured by different analyses and the number of analytes rejected or flagged as estimated due to corresponding quality control criteria. Place an "X" in the boxes where analyses were not performed or criteria do not apply.

2.4 Organic Regional Data Assessment - Data reviewer is also required to fill out Organic Regional Data Assessment Form (Attachment 3).

2.5 Telephone Record Log - The data reviewer should enter the bare facts of inquiry before initiating any authorized telephone conversation with a CLP laboratory. After the case review has been completed, mail the white copy of the Telephone Record Log to the laboratory and the pink copy to SMO. File the yellow copy in the Telephone Record Log folder and attach a photocopy of the Telephone Record Log to the completed Data Assessment Narrative.

2.6 Forwarded Paperwork - Upon completion of the review, the following are to be forwarded to the Regional Sample Control Center (RSCC) located in the Surveillance and Monitoring Branch:

a. data package
b. completed assessment checklist
c. SMO Contract Compliance Screening (CCS)

Forward four (4) copies of the completed Data Assessment Narrative along with four (4) copies of the Organic Data Assessment Form: one each for the appropriate Regional DPO, the Sample Management Office (SMO), and to the last two addresses of the Data Reviewers Mailing List.

2.7 Filed Paperwork - Upon completion of the review, the following are to be filed within the Monitoring and Management Branch (MMB) files:

a. Telephone record Log (copy)
b. Record of Communication (original)
c. Rejection Summary Form

Rejection of Data - All values determined to be unacceptable on the Organic Analysis Data Sheet (Form I) must be flagged with an "R". As soon as review criteria causes data to be rejected, that data can be eliminated from any further review or consideration.

Acceptance Criteria - In order that the reviews be consistent among reviewers, this Standard Operating Procedure (SOP) should be used. Additional guidance can be found in the Functional Guidelines.

SMO Contract Compliance Screening (CCS) - This is intended to aid the reviewer in locating any problems, both corrected and uncorrected. However, the validation should be carried out even if CCS is not present. Resubmittals received from the laboratory in response to CCS must be used by the reviewer.

AGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: SDG# C0436

LAB: Roy F. Weston - Stockton

SITE: Pas Clothier

Data Completeness and Deliverables	YES	NO	N/A
1.1 Have any missing deliverables been received and added to the data package.	[___]	___	X
ACTION: Call lab for explanation / resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the package under the "Contract Problems/Non-compliance" section of reviewer narrative.			
1.2 Was SMO CCS checklist included with package?	[___]	X	___
Cover Letter/Case Narrative			
2.1 Is the Narrative or Cover Letter present?	[X]	___	___
2.2 Are Case Number and/or SAS number contained in the Narrative or Cover Letter?	[___]	X	___

Data Validation Checklist

The following checklist is divided into three parts. Part A is filled out if the data package contains any VOA analyses, Part B for any BNA analyses and Part C for Pesticide/PCBs.

Does this package contain:

VOA data?	___	X
BNA data?	X	___
Pesticide/PCB data?	X	___

ACTION: Complete corresponding parts of checklist.

	YES	NO	N/A

PART B: BNA ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [X] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [X] ___

ACTION: Use professional judgement to evaluate the effect on the quality of the data.

ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.

2.0 Holding Times

2.1 Have any BNA holding times, determined from date of collection to date of extraction, been exceeded? X [___] ___

Samples for BNA analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.

Table of Holding Time Violations

Sample	Sample Matrix	Date Sampled	(See Traffic Report) Date Lab Received	Date Extracted	Date Analyzed
CES-28	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-29	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-30	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-31	Soil	2/14/19	2/15/91	2/22/91	2/26/91
CES-32	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-33	Soil	2/14/91	2/15/91	2/22/91	2/26/91

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

Table of Holding Time Violations

Sample	Sample Matrix	Date Sampled	(See Traffic Report) Date Lab Received	Date Extracted	Date Analyzed
CES-34	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-35	Soil	2/14/91	2/15/91	2/22/91	2/26/91
CES-36	Soil	2/14/91	2/15/91	2/22/91	2/26/91

ACTION: If holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

	YES	NO	N/A
If analyses were done more than 14 days beyond holding time, either on the first analysis or upon reanalysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. The reviewer may determine that non-detect data are unusable ("R").			

3.0 Surrogate Recovery (Form II)

3.1 Are the BNA Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the BNA samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.			
3.3 Were outliers marked correctly with an asterisk?	[X]	___	___
ACTION: Circle all outliers in red.			
3.4 Were two or more base-neutral OR acid surrogate recoveries out of specification for any sample or method blank?	___	[X]	___
If yes, were samples reanalyzed?	[___]	___	X
Were method blanks reanalyzed?	[___]	___	X
ACTION: If all BNA surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet SOW specifications, for the affected fraction only (i.e. base-neutral OR acid compounds):			
1. Flag all positive results as estimated ("J").			
2. Flag all non-detects as estimated detection limits ("UJ").			

	YES	NO	N/A
If any base-neutral or acid surrogate has a recovery of <10% : 1. Flag all positive results for that fraction (i.e. all acid or base-neutral compounds) "J". 2. Flag all non-detects for that fraction "R". Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and re-analyses. Check the internal standard areas.			
3.5 Are there any transcription/calculation errors between raw data and Form II?	___	[x]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
4.0 Matrix Spikes (Form III)			
4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present?	[x]	___	___
4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:			
a. Low Water	[x]	___	___
b. Med Water	[___]	___	x
c. Low Soil	[x]	___	___
d. Med Soil	[___]	___	x
ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.			

4.3 How many BNA spike recoveries are outside QC limits?

Water	Soils
4 out of 22	3 out of 22

4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water	Soils
0 out of 11	0 out of 11

ACTION: If MS and MSD both have less than 10% recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples

	YES	NO	N/A
5.0 Blanks (Form IV)			
5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of BNA TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	[X]	___	___
ACTION: Use professional judgement to determine the effect on the data.			
6.0 Contamination			
NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.			
6.1 Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for BNAs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	X	[___]	___
6.2 Do any field/rinse blanks have positive BNA results (TCL and/or TIC)?	X	[___]	___
ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)			
NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.			

YES NO N/A

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

	Sample conc > CRQL but < 10x blank	Sample conc < CRQL & is < 10x blank value	Sample conc > CRQL value & >10x blank value
Common Phthalate Esters	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

	Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL value & > 5 blank value
Other Contaminants	Flag sample result with a 'U'; cross out 'B' flag	Reject sample result and report CRQL; cross out 'B' flag	No qualification is needed

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" (unusable).

6.3 Are there field/rinse/equipment blanks associated with every sample? [X] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 GC/MS Tuning and Mass Calibration (Form V)

7.1 Are the GC/MS Tuning and Mass Calibration Forms (Form V) present for Decafluorotriphenylphosphine (DFTPP)? [X] ___ ___

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift? [X] ___ ___

7.3 Has a tuning performance compound been analyzed for every twelve hours of sample analysis per instrument? [X] ___ ___

ACTION: If any tuning data are missing, take action specified in 3.2 above.

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

				YES	NO	N/A
DATE	TIME	INSTRUMENT	SAMPLE NUMBERS			

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundance criteria been met for each instrument used? [X] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If tuning calibration is in error, flag all associated sample data as unusable ("R"). However, if expanded ion criteria are met (See 1988 Functional Guidelines), the data reviewer may accept data with appropriate qualifiers.

7.5 Are there any transcription / calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.) X [___] ___

7.6 Have the appropriate number of significant figures (two) been reported? (Check at least two values, but if errors are found check more values.) X [___] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make necessary corrections and note errors under "Conclusions".

7.7 Are the spectra of the mass calibration compound acceptable? [X] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

8.0 Target Compound List (TCL) Analytes

8.1 Are the Organic Analysis Data Sheets (Form I BNA) present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [X] ___ ___

b. Matrix spikes and matrix spike duplicates [X] ___ ___

c. Blanks [X] ___ ___

	YES	NO	N/A
8.2 Are the BNA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[X]	___	___
c. Blanks	[X]	___	___
ACTION: If any data are missing, take action specified in 3.2 above.			
8.3 Are the response factors shown in the Quant Report?	[___]	X	___
8.4 Is chromatographic performance acceptable with respect to:			
Baseline stability	[___]	X	___
Resolution	[X]	___	___
Peak shape	[X]	___	___
Full-scale graph (attenuation)	[X]	___	___
Other:_____	[___]	___	X
ACTION: Use professional judgement to determine the acceptability of the data.			
8.5 Are the lab-generated standard mass spectra of the identified BNA compounds present for each sample?	[X]	___	___
ACTION: If any mass spectra are missing, take action specified in 3.2 above. If Lab does not generate their own standard spectra, make note in "Contract Problems/Non-compliance".			
8.6 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[X]	___	___
8.7 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
8.8 Do sample and standard relative ion intensities agree within 20%?	[X]	___	___
ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected, flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected (at the calculated detection limit).			

	YES	NO	N/A
9.0 Tentatively Identified Compounds (TIC)			
9.1 Are all Tentatively Identified Compound Forms (Form I, Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "J" qualifier?	[X]	___	___
9.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
a. Samples and/or fractions as appropriate	[X]	___	___
b. Blanks	[X]	___	___
ACTION: If any TIC data are missing, take action specified in 3.2 above.			
ACTION: Add "J" qualifier if missing and "N" qualifier to all identified TIC compounds on Form I, Part B.			
9.3 Are any TCL compounds (from any fraction) listed as TIC compounds (example: 1,2-dimethylbenzene is xylene—a VOA TCL—and should not be reported as a TIC)?	___	[X]	___
ACTION: Flag with "R" any TCL compound listed as a TIC.			
9.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	[X]	___	___
9.5 Do TIC and "best match" standard relative ion intensities agree within 20%?	[___]	X	___
ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate.			
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	X	[___]	___
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[___]	___

	YES	NO	N/A

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusion".

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration? [X] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete for the BNA fraction? [X] ___ ___

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

12.2 Are response factors stable for BNAs over the concentration range of the calibration (RSD <30%)? [___] X ___

ACTION: Circle all outliers in red.

ACTION: When RSD >30%, non-detects may be qualified using professional judgement. Flag all positive results "J". When RSD >90%, flag all non-detects as unusable ("R"). (Region II policy.)

12.3 Do any compounds have a RRF < 0.05? ___ [X] ___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has an average RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

	YES	NO	N/A
12.4 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or %RSD? (Check at least two values but if errors are found, check more.)	___	[x]	___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

13.0 GC/MS Continuing Calibration (Form VII)

13.1 Are the Continuing Calibration Forms (Form VII) present and complete for the BNA fraction?	[x]	___	___
13.2 Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	[x]	___	___

ACTION: List below all sample analyses that were not within twelve hours of the previous continuing calibration analysis.

_____

_____

_____

ACTION: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, call lab for explanation / resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").

13.3 Do any continuing calibration standard compounds have a RRF < 0.05?	___	[x]	___

ACTION: Circle all outliers in red.

ACTION: If any BNA compound has a RRF < 0.05, flag positive results for that compound as estimated ("J"), and flag non-detects for that compound as unusable ("R").

13.4 Do any compounds have a % difference between initial and continuing calibration RRF > 25%?	x	[___]	___

ACTION: Circle all outliers in red and qualify associated sample data as outlined in the table below:

YES NO N/A

% DIFFERENCE

25-50	50-90	>90
'J' positive results, no action for non detects	'J' positive results, 'UJ' non detects	'J' positive results, "R" non detects

13.5 Are there any transcription / calculation errors in the reporting of average response factors (RRF) or difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more.) ___ [X] ___

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

14.0 Internal Standards (Form VIII)

14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits for each continuing calibration? [___] X ___

ACTION: List all the outliers below.

Sample #	Internal Std	Area	Lower Limit	Upper Limit
SBLK62	Perylene-d12	44594	10763	43052

(Attach additional sheets if necessary.)

ACTION: If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard. If extremely low area counts are reported, or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable ("R").

14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard? [X] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

	YES	NO	N/A
15.0 Field Duplicates			
15.1 Were any field duplicates submitted for BNA analysis?	[___]	X	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

PART C: PESTICIDE/PCB ANALYSES

	YES	NO	N/A
1.0 Traffic Reports and Laboratory Narrative			
1.1 Are the Traffic Report Forms present for all samples?	[X]	___	___
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?	___	[X]	___
ACTION: Use professional judgement to evaluate the effect on the quality of the data.			
ACTION: If any sample analyzed as a soil contains more than 50% water, all data should be rejected.			
2.0 Holding Times			
2.1 Have any PEST/PCB holding times, determined from date of collection to date of extraction, been exceeded?	___	[X]	___
Samples for PEST/PCB analysis, both soils and waters, must be extracted within seven days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction.			
3.0 Surrogate Recovery (Form II)			
3.1 Are the PEST/PCB Surrogate Recovery Summaries (Form II) present for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X
3.2 Are all the PEST/PCB samples listed on the appropriate Surrogate Recovery Summaries for each of the following matrices:			
a. Low Water	[X]	___	___
b. Med Water	[___]	___	X
c. Low Soil	[X]	___	___
d. Med Soil	[___]	___	X

	YES	NO	N/A

ACTION: Call lab for explanation / resubmittals. If missing deliverables are unavailable, document effect on data under "Conclusions" section of reviewer narrative.

3.3 Were outliers marked correctly with an asterisk? [___] ___ X

ACTION: Circle all outliers in red.

3.4 Was surrogate (DBC) recovery outside of the contract specification for any sample or blank? ___ [X] ___

ACTION: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J" and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewers professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

3.5 Are there any transcription/calculation errors between raw data and Form II? ___ [X] ___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike Duplicate/Recovery Form (Form III) present? [X] ___ ___

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [___] ___ X

b. Med Water [___] ___ X

c. Low Soil [X] ___ ___

d. Med Soil [___] ___ X

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above.

4.3 How many PEST/PCB spike recoveries are outside QC limits?

Water	Soils
N/A out of 12	0 out of 12

	YES	NO	N/A
4.4 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			

Water	Soils
N/A out of 6	0 out of 6

ACTION: If MS and MSD both have less than zero recovery for an analyte, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for MS/MSD analysis. Use professional judgement in applying this criterion to other samples.

5.0 Blanks (Form IV)

5.1 Is the Method Blank Summary (Form IV) present?	[X]	___	___
5.2 Frequency of Analysis: for the analysis of Pesticide TCL compounds, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, med water, low soil, medium soil), whichever is more frequent?	[X]	___	___
5.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts. Is the chromatographic performance (baseline stability) for each instrument acceptable for PEST/PCBs?	[X]	___	___

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent blanks have positive results for PEST/PCBs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor.	___	[X]	___
6.2 Do any field/rinse blanks have positive PEST/PCB results?	___	[X]	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

	YES	NO	N/A

NOTE: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate, spectral, tuning or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks.

Sample conc > CRQL but < 5x blank	Sample conc < CRQL & is < 5x blank value	Sample conc > CRQL & > 5x blank value
Flag sample result with a "U"; cross out "B" flag	Reject sample result and report CRQL; cross out "B" flag	No qualification is needed

6.3 Are there field/rinse/equipment blanks associated with every sample? [x] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 Calibration and GC Performance

7.1 Are the following Gas Chromatograms and Data System Printouts for both Primary and Confirmation (confirmation standards not required if there are no positive results above CRQL) column present:

a. Evaluation Standard Mix A [x] ___ ___

b. Evaluation Standard Mix B [x] ___ ___

c. Evaluation Standard Mix C [x] ___ ___

d. Individual Standard Mix A [x] ___ ___

e. Individual Standard Mix B [x] ___ ___

f. Multi-component Pesticides Toxaphene & Chlordane [x] ___ ___

g. Aroclors 1016/1260 [x] ___ ___

h. Aroclors 1221, 1232, 1242, 1248, and 1254 [x] ___ ___

ACTION: If no, take action specified in 3.2 above

	YES	NO	N/A
7.2 Is Form VIII Pest-1 present and complete for each GC column (primary and confirmation) and each 72 hour sequence of analyses?	[X]	___	___

ACTION: If no, take action specified in 3.2 above.

7.3 Are there any transcription/calculation errors between raw data and Form VIII?	___	[X]	___

ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".

7.4 Has the total breakdown on quantitation or confirmation column exceeded 20% for DDT?	___	[X]	___
- for Endrin?	X	[___]	___
or if Endrin aldehyde and 4,4'-DDD co-elute and there is a peak at their retention time, has the combined DDT and Endrin breakdown exceeded 20%?	___	[___]	X

ACTION:

a. If DDT breakdown is greater than 20% on quantitation column beginning with the samples following the last in control standard:

1. Flag all positive DDT results "J".
2. If DDT was not detected but DDD and/or DDE are positive, flag the DDT non-detect "R".
3. Flag positive DDD and DDE results "JN".
4. If DDT breakdown is > 20% on confirmation column and DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether DDT should be reported on Form I (if reported, flag result "N").

b. If Endrin breakdown is > 20% on quantitation column, beginning with the samples following the last in control standard:

1. Flag all positive Endrin results "J".
2. If Endrin was not detected, but Endrin Aldehyde and/or Endrin Ketone are positive, flag the Endrin non-detect "R".
3. Flag Endrin Ketone positive results "JN".
4. If Endrin breakdown is > 20% on confirmation column and Endrin is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin should be reported on Form I (if reported, flag result "N").

c. If the combined breakdown is used (it can only be used if the conditions in 7.4 above are met) and is > 20% on quantitation column beginning with the last in control standard, take the actions specified in 7.4 a and b above. If the combined breakdown is >20% on confirmation column and Endrin or DDT is identified on quantitation column but not on confirmation column, use professional judgement to determine whether Endrin or DDT should be reported on Form I (if reported, flag result "N").

	YES	NO	N/A
7.5 Is the linearity check RSD of all four calibration factors <10% for the quantitation column?	[X]	___	___
ACTION: If no, flag positive hits for all pesticide and PCB analytes "J" for all associated samples. Do not flag toxaphene or DDT if they are quantified from a 3-point calibration curve.			
7.6 Is the % difference between the EVAL A and each analysis (quantitation and confirmation) DBC retention time within QC limits (2% for packed column, 0.3% for capillary [I.D. < 0.32 mm], 1% for megabore [0.32 < I.D. < 2 mm]) ?	[X]	___	___
ACTION: DBC retention time cannot be evaluated if DBC is not detected. If it is present and has a retention time out of QC limits, then use professional judgement to determine the reliability of the analysis and flag results "R", if appropriate.			
7.7 Was the proper analytical sequence followed for each 72 hour period of analyses (page PEST D-36 in 8/87 SOW).	[X]	___	___
ACTION: If no, use professional judgement to determine the severity of the effect on the data and accept or reject it accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.			
8.0 Pesticide/PCB Standards Summary			
8.1 Is Form IX present and complete for each GC column and 72 hr sequence of analyses?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
8.2 Are there any transcription/calculation errors between raw data and Form IX?	X	[___]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
8.3 Is DDT' retention time for packed columns > 12 min (except OV-1 and OV-101 columns)?	[X]	___	___
ACTION: If no, check that there is adequate resolution between individual components. If not, flag results for compounds that interfere with each other (co-elute) "R".			
8.4 Do all standard retention times fall within the windows established for the first IND A and IND B analyses?	[X]	___	___

	YES	NO	N/A
ACTION: Beginning with the samples following the last <u>in control</u> standard, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times. If no peaks are found and, DBC is visible non-detects are valid. If peaks are present and cannot be identified through "pattern recognition" or a consistent shift in standard retention times, flag all affected compound results "R".			
8.5 Are the continuing calibration standard calibration factors within 15% (for quantitation column) or 20% (for confirmation column) of the initial (at beginning of 72 hr sequence) calibration factors?	[___]	[X]	___
ACTION: If no, flag all associated positive results "J". Use professional judgement to determine whether or not to flag non-detects.			
9.0 <u>Pesticide/PCB Identification</u>			
9.1 Is Form X complete for every sample in which a pesticide or PCB was detected?	[X]	___	___
ACTION: If no, take action specified in 3.2 above.			
9.2 Are there any transcription errors between raw data and Form X?	___	[X]	___
ACTION: If large errors exist, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
9.3 Are retention times of sample compounds within the calculated retention time windows for both quantitation and confirmation analyses?	[X]	___	___
Was GC/MS confirmation provided when required (when compound concentration is > 10 ug/ml in final extract)?	[___]	___	X
ACTION: Reject ("R") all positive results (meeting quantitation column criteria, but missing confirmation by a second column or GC/MS (if appropriate). Also, reject ("R") all positive results not meeting retention time window criteria unless associated standard compounds are similarly biased (i.e. base on RRT to DBC).			
9.4 Check chromatograms for false negatives, especially for the multiple peak components toxaphene and PCB's. Were there any false negatives?	___	[X]	___
ACTION: If appropriate PCB standards were not analyzed, or if the lab performed no confirmation analysis, flag the appropriate data with an "R".			

	YES	NO	N/A
10.0 Compound Quantitation and Reported Detection Limits			
10.1 Are there any transcription / calculation errors in Form I results? Check at least two positive values. Were any errors found?	X	[ ]	
NOTE: Simple peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.			
10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X	[ ]	
ACTION: If errors are large, call lab for explanation / resubmittal, make any necessary corrections and note errors under "Conclusions".			
ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.			
11.0 Chromatogram Quality			
11.1 Were baselines stable?	[X]		
11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?		[X]	
11.3 Were early eluting peaks (for early eluting analytes) resolved to baseline?	[X]		
ACTION: For 11.1 and 11.2, comment only. For 11.3, reject ("R") those analytes that are not sufficiently resolved.			

	YES	NO	N/A
12.0 Field Duplicates			
12.1 Were any field duplicates submitted for PEST/PCB analysis?	[___]	_X_	___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.